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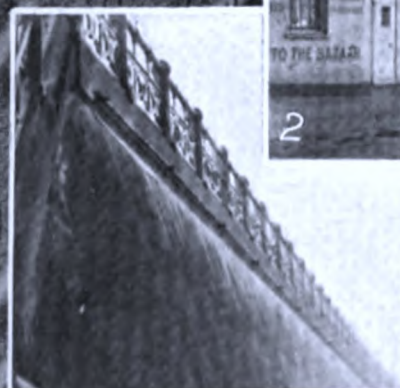
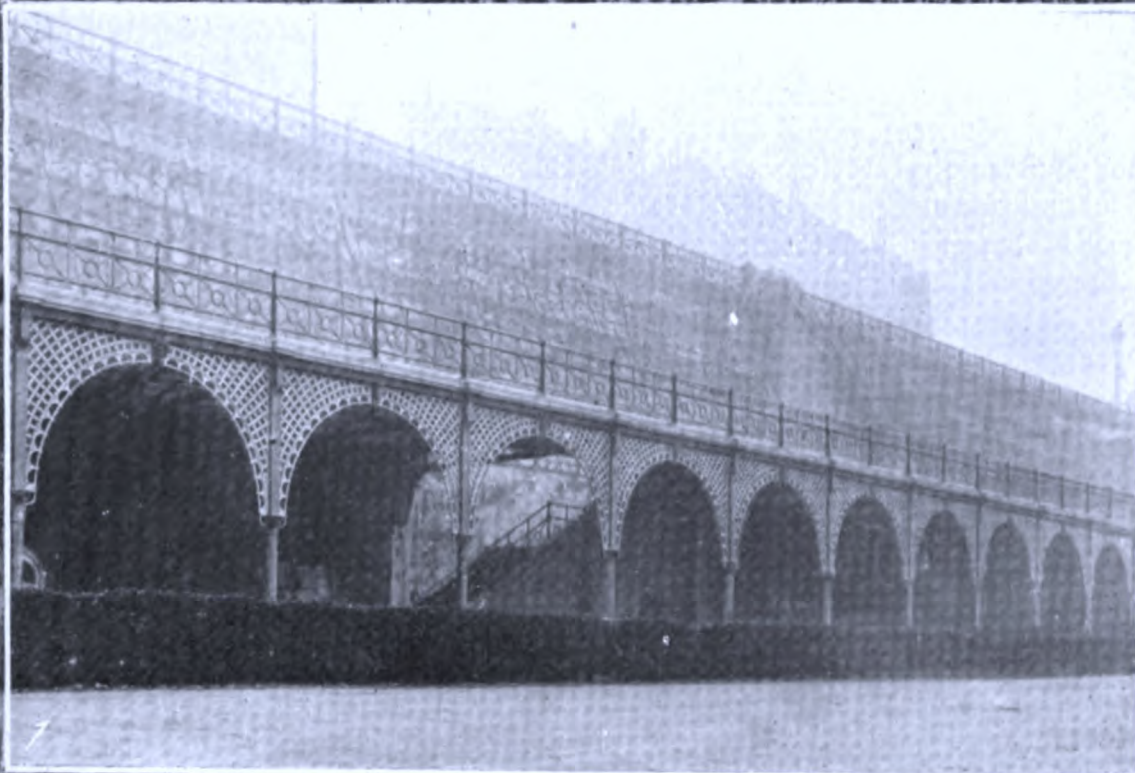
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The Auto



The Automotor Journal, January 7th, 1905.

TRANSPORT

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

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GORDON-BENNETT CUP RACE.—The Auvergne Circuit. View at the cross roads, where it has been suggested the start should take place.

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DIARY OF FORTHCOMING EVENTS.

British Events.

1905.		
Jan. 10 ...	Lesson IV.—On the Internal Combustion Engine (Ladies' A.C.).	
Jan. 12 ...	*First Year's Working of the Motor Car Act. Paper by Mr. Moresby White.	
Jan. 17 ...	Lesson V.—On the Internal Combustion Engine (Ladies' A.C.).	
Jan. 19 ...	*The Paris Salon, by Mr. Cozens Hardy.	
Jan. 21-28 ...	Birmingham Motor Car Show (Bingley Hall).	
Jan. 24 ...	Lesson VI.—On the Internal Combustion Engine (Ladies' A.C.).	
Jan. 26 ...	*Problems of Traffic, by Mr. J. Swinburne.	
Jan. 27-Feb. 4 ...	Crystal Palace Automobile Show.	
Feb. 7 ...	Motor Mountaineering in the Alps. Illustrated lecture by Capt. Deasy (Ladies' A.C.).	
Feb. 10-18 ...	Society of Motor Manufacturers' and Traders' Exhibition at Olympia.	
Feb. 15 ...	A.C.G.B.I. Annual Dinner (Hotel Cecil).	
Feb. 24-Mar. 4 ...	Edinburgh Motor and Cycle Show.	
Feb. 24 ...	Manchester Motor Show.	
Mar. 3-11 ...	Liverpool Motor Cycle Show.	
Mar. 18-25 ...	Cordingley's Exhibition (Agricultural Hall).	
Apl. 1 ...	*Light Van Trials.	
Apl. 3-8 ...	Auto Cycle Club Light-weight Motor Bicycles Trial (1,000 Miles).	
July 1st ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).	

Foreign Events (Trials, Races, &c.).

1905.	
Jan. ...	Transmission Gear Trials (Paris).
Jan. 14-21 ...	New York Exhibition.
Jan. 14-24 ...	Fourth Brussels Salon.
Jan. 21-Feb. 6 ...	Turin Automobile Exhibition.
Jan. 23-28 ...	Ormonde Beach (Cal.) Meeting.
Feb. ...	Versaille Endurance Trial (Seine-et-Oise A.C.).
Feb. 4-11 ...	Chicago Exhibition.
Feb. 4-12 ...	Stockholm Meeting and Ice Racing.
Feb. 4-19 ...	Berlin Automobile Exhibition.
Feb. 13-16 ...	Detroit Exhibition.

* Automobile Club of Great Britain and Ireland Events and Papers.

Feb. 15 ...	Turin Automobile Salon.
Feb. 18-25 ...	Versailles Reliability Trials (A.C. Seine et Oise).
Mar. 13-18 ...	Boston Exhibition.
Mar. 15-Apl. 9 ...	Copenhagen Exhibition.
Mar. 16-29 ...	Vienna Exhibition.
Mar. 27-Apl. 5 ...	Washington Exhibition.
Apl. 2-16 ...	Monaco Motor Boat Fortnight.
April ...	Nice Automobile Week.
May ...	Paris Industrial Vehicles Trials (A.C. France).
May 11-25 ...	Stockholm Automobile Exhibition.
May 14 ...	International Motor Cycle Cup.
June 26 ...	Mont Cenis Hill Climb.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Calais-London (Motor Boats).
Aug. 6-9 ...	Paris-Trouville (Motor Boats).
Aug. 10 ...	Gaston Menier Cup (Motor Boats).
Aug. 11 ...	Anthony Drexel Cup (Motor Boats).
Aug. 12 ...	International Cup for Motor Boats.
Aug. ...	Herkomer and Bleichroder Races.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Vincenzo-Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.
Sept. 3-10 ...	Spa Automobile Club.
Sept. 11 ...	British International Cup for Motor Boats (Arcachon).

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PASSING EVENTS.

Tinkering with the Gordon-Bennett Race.

THOSE who are interested in automobile racing as a sport, and the Gordon-Bennett Race in particular, will probably be disposed to regard with mixed feelings the comparatively unimportant position to which the A.C. de F., at the instance of a number of French manufacturers, propose to relegate it. Last year, and the year before, it was the principal event of the automobile racing world. It had, in fact, become the international automobile Derby, and as such concentrated upon itself the interest of the whole automobile world. It was not always so. Till Mr. Edge won it for this country in 1902, the race for the Gordon-Bennett Cup had formed what might be not altogether incorrectly described as "the tail of the hunt" in the great Continental races, of which Paris-Bordeaux was one of the earliest. The inherent importance of the Gordon-Bennett Race as an institution—of a race, that is, which was originally

intended to bring out the relative merits of the manufacturers of different countries by restricting the competitors to cars and fitments entirely made in the country which they represented—is overshadowed by this condition of affairs. Mr. Edge's victory in 1902 conferred a distinct service on the sport generally by effecting the separation of the Gordon-Bennett Race from other great events, and converting it into an independent institution, a *rôle* in which, by the way, it did excellent service to the cause of racing, as after what it was for some time customary to term the Paris-Madrid "holocaust," racing was placed under a cloud. This, the excellent arrangements for the Gordon-Bennett Race in Ireland, showing as they did that reasonable care, and, above all, limitation of numbers, could prevent the occurrence of anything like a catastrophe, subsequently dispelled.

There appears to have grown up recently a wish among the French manufacturers to deprive the Gordon-Bennett Race of this independent character. One of the reasons put forward is that each country is represented by three cars, no matter what may be the proportions of its automobile industry. This, of course, gives other countries like Great Britain and Switzerland, the latest recruit in the ranks of automobile manufacture, an even chance with the Republic. Some people might be disposed to think that this would contribute to improve the sporting character of the event. But this is not the view prevailing in France. The French manufacturers think that that country ought to have advantages in races, proportionate to the scale of their manufactures. As such an innovation cannot be introduced into the Gordon-Bennett Race for this year, they have organised, as we have already stated, another international contest, to be entitled the Grand Prix de l'Automobile Club de France, and for this the number of entries will be unlimited.

This is all very well. If the French like to organise a race of this kind, and conduct it carefully, everybody ought to be quite happy. But it is now proposed that the Gordon-Bennett Race should be run at the same time; that is to say, that it should once again bring up the "tail of the hunt" as it did in the days of Paris-Bordeaux and Paris-Vienna. In fact, it is a proposal that the Gordon-Bennett Race, having for two years been an independent sovereign, should once more become a vassal of a great French institution.

These, however, are only sentimental considerations. The practical consideration, and the consideration of importance for other competing countries, is that the suggested arrangement will constitute a distinct handicap in favour of France. It is true that there will be only three French cars in the Gordon-Bennett Race, but there may be thirty, forty, or fifty running in the Grand Prix. Some of these are sure to find themselves out of it, and though they may have little chance of winning the Grand Prix, they may be able *pour passer le temps*, to do a good deal to keep other countries from winning the Gordon-Bennett. *Verb. sap. sat.*

In fact, we cannot look upon the proposal to hold the Gordon-Bennett at the same time as the Grand Prix as altogether sportsmanlike. When this country held the Cup there were no attempts to mix up the race with any other event. When Germany held the Cup her action was the same as ours. Now that France has got the Cup back again, she seems to want to *screw it down*. The Belgian Pipe Company has already protested. Mr. Edge has sent in a strong protest to our own club, as the result of which that body will probably take

decided action. We would recommend that they should actively approach the other European clubs, pointing out these aspects of the question, which may not have been fully realised. Ultimately, no doubt, they may withdraw and protest, but we think it far wiser not to retire like Achilles into his tent at present, but rather to put their views before the other clubs, as we feel sure that when these other clubs realise the situation they will agree with the A.C.G.B.I., and we think it will be found that a way out of the difficulty, in the event of the majority of clubs agreeing, can be discovered under the existing rules governing the Cup race.

Promising Prospects for London Locomotion.

THE probabilities that the substitution of motor power for horse power on a large number of London 'buses will soon be an accomplished fact is borne out by the very satisfactory intelligence that the London Road Car Company is issuing the balance of its authorised share capital, viz., £116,000, for the purpose of introducing a large number of motor 'buses on their routes in the Metropolis. This is a most encouraging prospect, and it shows that the Company are thoroughly in earnest and are taking up the subject in a manner and on a scale which is very sharply distinguished from most previous attempts in the same direction. We are rather sorry to understand that of the fifty cars at present ordered, practically the whole will be manufactured in Germany and Belgium, but fifty omnibuses is, after all, a small matter for the Road Car Company, and English manufacturers have done so well in heavy traction that we may trust before long to see the large orders for the 'buses that this enterprising company will doubtless place in the near future given to home manufacturers.

The Heavy Traction Regulations at Last.

THE Local Government Board has presented the heavy traction industry with a New Year's gift which will have the effect of removing the suspense under which, as we have repeatedly pointed out, it has for many months past acutely suffered. The suspense is over at last, and all builders and users of "heavy motor cars" will be heartily thankful for the relief. The regulations will almost certainly remain in force for several years to come, so that both motor lorry and trailer builders will be able to get to work, and purchasers will be able to organise economical heavy traction services without the fear which has, during the past year, been ever present with them, that they might ultimately be compelled to scrap their vehicles.

The most important aspect of the whole question, therefore, is that the regulations have been issued. Had they been even comparatively inadequate, the issue of them would have been—as we again said only last week—far better than the suspense which has been so long endured. Yet on the whole it must be admitted that the regulations as issued by the Board are in the main satisfactory. And there can be no question whatever that they are an honest effort to cope with the situation, to afford as much latitude as possible to the heavy motor car builder and user, while at the same time conciliating as far as possible the, to some extent, opposing interests of local and road authorities. Were we compelled to offer any general criticism it would take the form of regret that so much apparently unnecessary delay in the issue of the regulations has been allowed to take place. In all their outlines, the regula-

tions actually now forming a part of our laws—for this the regulations of a department under an Act of Parliament do—are substantially the same as the proposals issued to interested bodies (for their observations) a good six months ago, and it would at first sight, therefore, appear that the present regulations might profitably have been decided upon then. However, it is always better to be sure than sorry, and we may, therefore, feel certain that the regulations will not undergo a speedy or capricious modification, and perhaps that certainty was worth waiting for.

How the Regulations have been Promulgated.

HAVING agreed upon the regulations they determined to adopt, the Local Government Board have proceeded with their customary thoroughness and issued with them both an explanatory circular to the local authorities (the County and County Borough Councils) who will be concerned in putting the regulations into effect, and an exemplification illustrating the manner in which the regulations will have to be carried out in practice. The regulations are so important that we publish them *in extenso* elsewhere. At the same time, a summary of the main points of them will, doubtless, be of use to our readers.

The first and greatest concession is the rise in tare-weight. Formerly the limit, as most people know, was 3 tons for a motor lorry unladen, and one was familiar with what perhaps there is now no longer any harm in terming the pleasing conviction by which most of these vehicles were embellished with a statement that they weighed exactly 2 tons, 19 cwt., and some odd pounds. Wisely, we think, the authorities winked at this fiction, but now there will be no need to adopt a benevolent attitude on this question, as the tare-weight is raised to 5 tons. The total weight of any such lorry with its load is restricted to 12 tons, and there is a further restriction limiting the weight that must be borne on any one axle to 8 tons. This has been dictated out of consideration for the road authorities, and, as it enables two thirds of the total weight of a lorry to be put, if desired, on the driving axle, it should be ample for all practical purposes. Some time ago a discussion took place in the columns of this Journal on the subject of whether the increase to 5 tons in tare weight would be really adequate. It was recognised by certain leading authorities (in fact, by most people who have bestowed serious attention on the subject), that for luries to be commercially successful in heavy goods transport, they must be capable of carrying loads in the neighbourhood of 6 to 8 tons, and it was questioned at the time whether vehicles could be satisfactorily manufactured to carry such loads and not exceed 5 tons in weight. That, however, was a good many months ago, and there is every ground for the belief that improved materials and methods of construction have now partially removed that difficulty.

A concession has been made in the matter of trailers, the combined tare-weight of lorry and trailer being raised to $6\frac{1}{2}$ tons, while the permissible width of a heavy motor car is now 7 ft. 6 ins.—by heavy motor car being understood (as before) any vehicle which exceeds 2 tons in weight unladen. The regulations allow $1\frac{1}{2}$ tons for the trailer unladen. As the axle-weight in the case of trailers is limited to 4 tons, this will mean that the maximum useful load that can be carried by the trailer will be $8 - 1\frac{1}{2} = 6\frac{1}{2}$ tons, so that heavy luries with trailers, therefore, will be able to deal with the traffic and merchandise of the country to the extent of

$13\frac{1}{2}$ tons altogether, the lorry itself carrying 7 tons of useful load, and pulling a trailer carrying a load which will amount to $6\frac{1}{2}$ tons. It would, however, seem to follow that any manufacturer who can make either a lorry or trailer to carry the same maximum load, lighter than the tare limit assigned, will be allowed to increase the weight of the load by that amount. But it is not altogether probable that many of them will take the risk of breakdown that this might involve.

Limitations of Speed and Tyre Width.

SPECIAL pains have been taken in framing the regulations to ensure that the width and diameter of wheels shall bear a due proportion to the loads carried. Where inelastic, that is to say (in practice) iron or steel, tyres are used, they must never be less than 5 inches in width on the lorry, nor less than 3 inches on the trailer, nor must the wheels be less than 2 feet in diameter. An increase in tyre diameter is accompanied by a reduction in width, if the axle weight remain constant. Thus, for instance, where the weight on any axle is 6 tons, the tyre of a wheel 3 feet in diameter would have to be 8 inches in width. If, however, the diameter of the wheel is increased, then the tyre need not be proportionately increased in width. Thus, if in the case in question, the diameter of the wheel is increased to, say, 5 feet, the tyre need be only $6\frac{1}{2}$ inches wide. Where pneumatic tyres, or tyres of a soft or elastic material, are employed, there are no limitations in this respect. There are limitations, too, in regard to the pace at which motor luries and trailers may proceed. On the whole we think a wise provision. At any rate, one which will be calculated to diminish the number of complaints, of which there have been a good many, of the noise occasioned in our streets at unseasonable hours of the night.

Recognition of the Educative Value of Automobilmism.

EVERYONE will learn with satisfaction that the Society of Motor Manufacturers and Traders is recognising the educational value of the great Show which will open at Olympia next month by according free admission, under certain conditions, to all engineering students of any recognised school. The educative value of the automobile movement is one of its beneficial social effects on which we have been keen to insist for a long period past. Mostly, when considering the subject, we have had in mind the great body of car owners and car users, and it is of course amongst them that the automobile has produced in the first instance its supremely educative effect. After all, what is culture, knowledge, and real education but the power to overcome the brute forces of nature by the exercise of supreme intelligence? There is, of course, division of labour. There is the man who thinks in his study or who works in his laboratory on the one hand, amassing unapplied knowledge—the sort of knowledge that is usually described as theoretical—and there is the practical man, the engineer and the workman, who in the sharp contest with the rough material with which the world supplies him, is perhaps disposed to underrate abstract information. Often these two branches of the scientific professions look upon one another with some disdain. It is said that the more theoretic branch of scientific people would be the better for a greater facility in applying their knowledge in practice, and that the pre-eminently practical people would be better if they had more theoretical knowledge to guide their practice. Certainly it is the complete union of the two that makes the really triumphant engineer, and

perhaps there is no higher type of the educated man than he is, for he accomplishes, to a greater extent than most of his fellow creatures can do, what it appears man's place in nature to achieve—a conquest of the forces of nature. In this great sphere, as we have often pointed out, the automobile is playing a conspicuous part. Many an intelligent country gentleman, whose horizon was once limited by foxhounds in full cry and the best method of erecting palings, is now keenly interested in the improvements in automatic locomotion and the effect which they will have on his somewhat remote sphere of life. After all, there are few greater triumphs over nature than those which automatic locomotion provides. Besides the car owners there is growing up a class of mechanic who sees the direct results of what he does. Most mechanics hitherto have played a small part in the construction of some great machine, of the effect of which in the general industries of the country they have but a very hazy conception. It is not so with the mechanic and driver of an automobile. The result his machine produces is clear to himself and everyone else, and he is the better for realising it. These are some of the effects, to touch on them lightly, that the ownership and direct familiarity with the automobile produces, but for it to produce its full educational effect we want to enlist a larger army of interested people. The automobile industry is growing. Its satisfactory development depends on its being provided with an adequate supply of intelligent young men who have had an engineering training, and who can be relied upon to improve British manufacture. It is very important that before specialising in automobilism, they should first of all have had a general technical training.

Theory and Practice.

For one of the things that is wanted at the present stage of development of the automobile industry is that it should be recognised as one of the branches in which the engineering student can specialise. Technical schools and institutes necessarily concern themselves as they should, mainly with imparting those general principles and departments of knowledge, acquaintance with which is essential to specialism in any particular side of engineering. The engineering trips at Cambridge, that triumph of the new spirit over the old, never aimed at turning out working engineers. Its object was to train students in the principles which they should subsequently practically apply, and the other institutes which follow that lead have in general adopted a similar line. Nothing, therefore, can be more important for the engineering and technical students of the country than an opportunity of realising what a great industry automobilism has become, and what a magnificent field it offers for specialising in. All our papers are filled with the cry of the extent to which the electrical engineering profession for example is over-stocked. Other branches of engineering are in a similar plight. There are more young men with a preliminary training willing to enter them than there are berths to bestow upon them. In this respect the automobile industry is largely different. It is growing, and growing rapidly, and it makes quite as high demands on the intelligence, initiative, technical training, practical common sense, readiness in emergency, not to mention sometimes real physical courage, and all the qualities that go to make a man, as any of the other engineering industries supply.

It is singularly opportune, therefore, that the management of the Olympia Exhibition are arranging to allow free entry to that great show to all students at engineering schools, provided that the principals of the schools apply for these free tickets to the secretary of the Society of Motor Manufacturers and Traders, Limited, Clun House, Surrey Street, Strand, W.C., and this we venture to trust that those anywhere near the Metropolis will not fail to do. It would be difficult to exaggerate what an opportunity is thus provided. One of the most prized facilities that can be put in the way of engineering students in any department is an opportunity of examining finished machinery. Here they will have an "*embarras de richesse*" of the latest products of automobile engineering, and presumably they will have the guidance of their teachers in inspecting it.

And a Word of Advice.

In embracing this opportunity so generously placed at their disposal by the Society of Motor Manufacturers and Traders, we would venture to hope that teachers and students will not make the mistake during the very short period that the Show is open of attempting to grasp the whole of the exhibits displayed in detail and, without any guiding principle to direct their observations. To obtain the really educative effect which a great exhibition of this kind is capable of bestowing, what is really needed is for those students who visit it to grasp what are the general principles underlying automobile construction which have lived up to the present through the struggle of the survival of the fittest, and which illustrate the tendencies of engineering principles as applied to self-propelled locomotion. It is from this point of view that we have ourselves for some time past approached all the leading exhibitions. In a recent number we pointed out that the tendencies which are gradually crystallising into standard practice and will probably characterise the majority of automobiles of the year 1905, were first put before the public at the Paris Salon, and our descriptive articles of this Exhibition should furnish a useful guide to students and others when visiting the Olympia show.

The visit should have a stimulating effect upon the students. A student who is attending a more or less theoretical course of instruction, is often but too apt to look upon the facts retailed to him in the lecture room as dry in themselves, and deficient in application to the practical problems of life. In automobile construction, he will see the highest triumphs of these principles applied to a particular problem, and one of the most interesting that engineers have ever had to solve—the problem of self-propelled traction, and the reaction on his studies cannot fail to be a favourable one. Ultimately the reaction on the automobile industry will be favourable too. The more our works are supplied with students who have enjoyed an adequate theoretical engineering training before specialising in automobile construction, the more satisfactory and the more rapid will the progress of English automobile manufacturing become, and even those who specialise mainly as drivers and mechanics will be benefited.

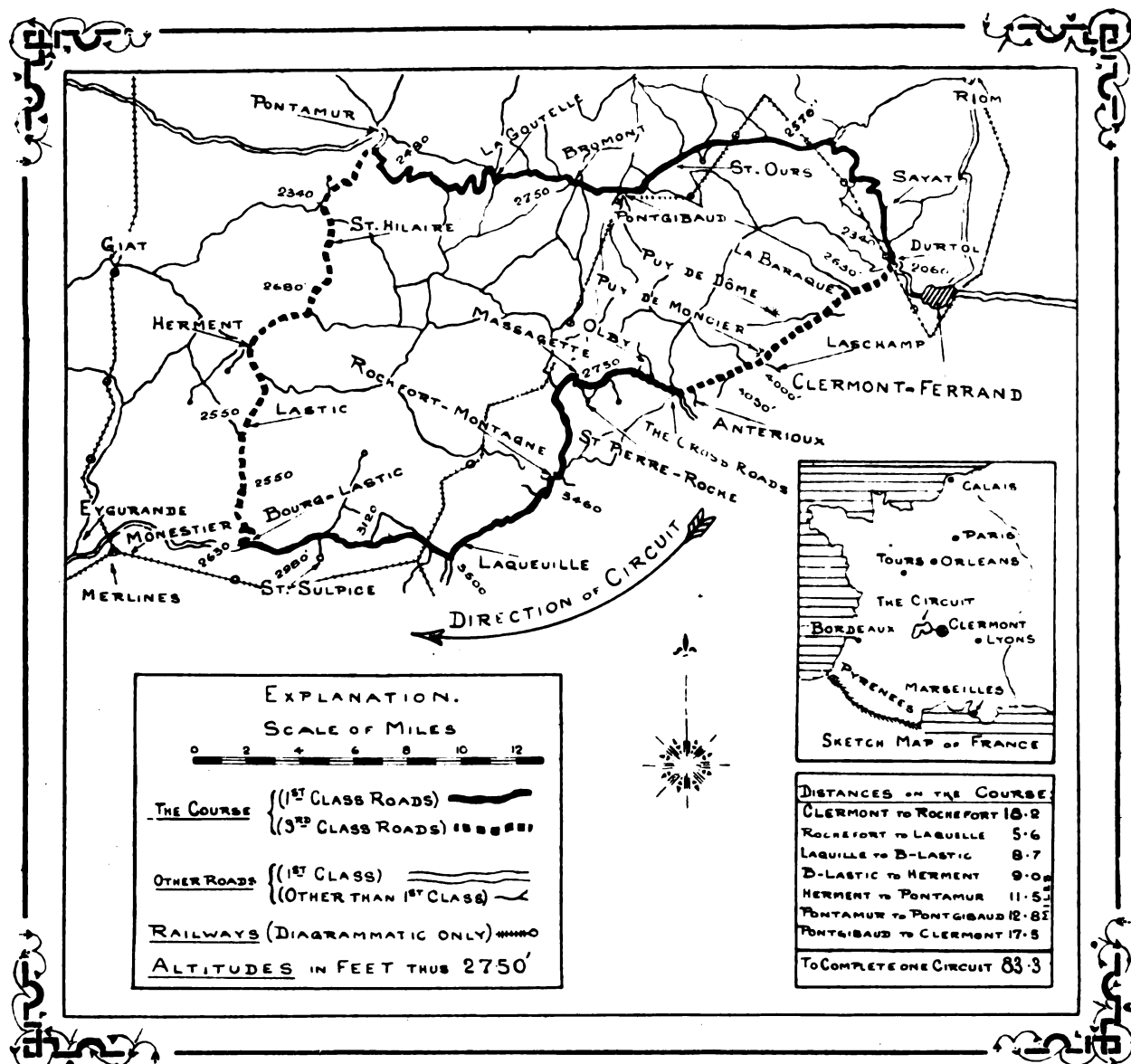
* * * Owing to the heavy pressure on our space, it has been necessary to hold over correspondence and other matters until next week.

GORDON-BENNETT CUP AND THE A.C. DE FRANCE CUP RACES.

BRITISH entries for participating in the Eliminating Trials for this race closed on Saturday last, when in all ten cars were entered, viz., three Napiers by Mr. S. F. Edge, to be driven respectively by Mr. Arthur MacDonald, Mr. Cecil Edge, and Mr. Clifford Earp, one of these cars being the 100-h.p. 6-cylinder car which gave such a good account of itself at Gaillon Hill Climb. A fourth Napier is entered, and will be driven by Mr. John Hargreaves.

Bennett Race on the Auvergne Circuit at the same time as the A.C. de France Cup Race, it may be unnecessary to hold any Eliminating Trials, owing to withdrawals which are likely to occur among British entrants, even if the British Club do not, by way of protest, withdraw altogether from participation in the race under such conditions.

NOMINALLY eight countries are down to compete, viz., France, England, Germany, Italy, Switzerland, America,



Map of the Auvergne Circuit.

Two Wolseley cars of 90-h.p. each are also entered, one of which will be driven by Mr. Sidney Girling. Two 100-h.p. Star cars are entered by Mr. J. Lisle, and a 100-h.p. Siddeley car is entered by Mr. Lionel de Rothschild, and a 100-h.p. British-built Darracq car by Mr. Guinness, to be driven by Mr. A. Rawlinson.

THE Selection Trials will, as before, probably take place in the Isle of Man, as already announced, although if the French Club persists in running the Gordon-

Austria, and Belgium. The withdrawal, however, of the manufacturers of the Pipe car, by way of protest to the running of the race side by side with a huge flock of cars as proposed, may reduce this number to seven.

As we stated last week, when we gave an outline map of the course, the selection of the Auvergne Circuit was practically a foregone conclusion for the running of the Gordon-Bennett Race, and whilst we were still printing, the news came to hand that our forecast was correct.

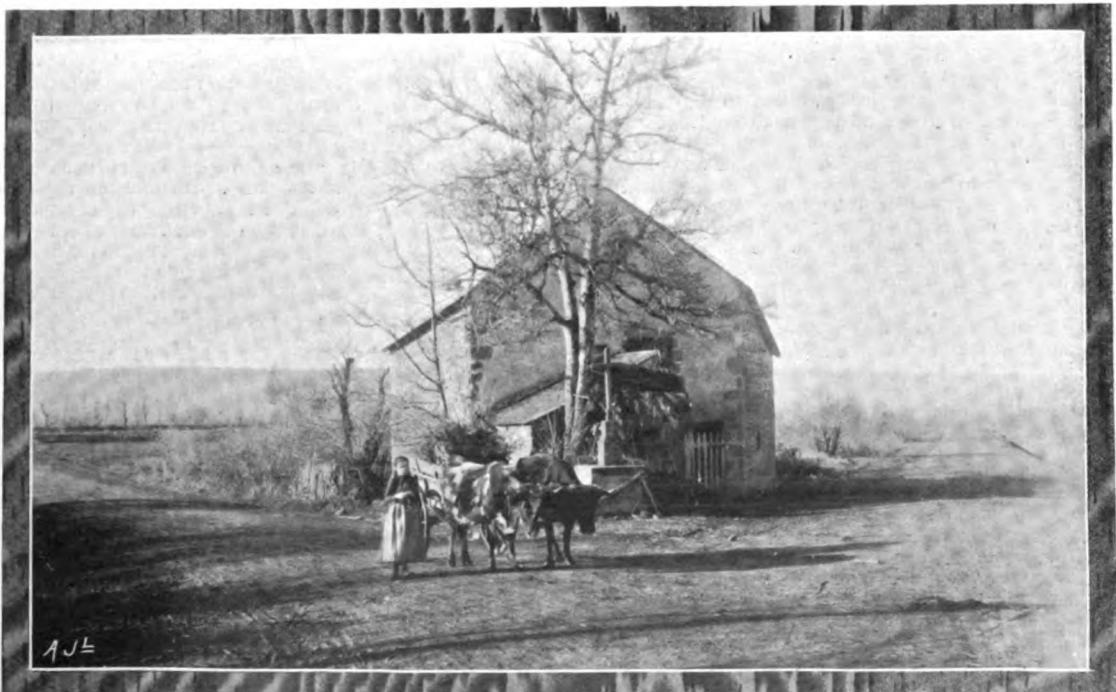


GORDON-BENNETT' CUP RACE.—La Col de la Moreno. Altitude 1,260 metres. Note the drifted snow lying to the left.

Also the proposed new international race, which was proposed originally by M. Georges Prade in *Les Sports*, was adopted by the A.C. de France practically in its entirety, with the exception that the name put forward of the Grand Prix Automobile de la Republique has been changed to the Grand Prix de l'Automobile Club de France. The determination of the club to run the Gordon-Bennett Cup Race at the same time as this

new competition on the Auvergne Circuit, was also officially decided.

The sensation of the whole proceedings, however, were reserved for the following morning, when *L'Auto* announced the offer of a first prize of 100,000 francs in cash for the manufacturers of the winning car in the new international race. The effect of this sensational offer was electrical, not only in France, but throughout



GORDON-BENNETT' CUP RACE.—Before reaching Rochefort.—The Course is to the right. A typical local "team" is seen in the picture.

the whole of Europe, and so far as this race is concerned instantly sealed its success in regard to securing entries. Without the rules which are subsequently issued provide for the keeping within reasonable limits the number of competitors, the cars likely to take part in the race would be moderately estimated at 100.

Of course, the decision of the French club and manufacturers in regard to this race and to the selection of the circuit on which it shall be run is one thing, and the authorisation by the French Government is another. The latter have still to be heard from, and it is well within the realms of possibility that they will not undertake the responsibility of authorising the launching of 100 monster racing cars (more or less) on an 83 miles' circuit, particularly a circuit naturally so difficult and dangerous as at many points the Auvergne Circuit is reported to be. One point favourable to its receiving official sanction, is that President Loubet will probably attend the meeting.

IN the meantime, the dispute which has been raging, particularly in *L'Auto* and *Les Sports*, as to the originator of the idea is hardly dignified, and M. Georges Prade, in the latter, hits home in strong fashion in regard to his claim in this respect, and he particularly impeaches the championship on behalf of the A.C. de France of the Marquis de Chasseloup-Laubat. To those who have followed the proceedings day by day recently, there can be little doubt that the credit for suggesting the entire scheme, for whatever it is worth, must be accorded to M. Georges Prade.

THIS week we publish a more detailed map of the district of the proposed circuit, as well as some photographs of some of the leading features. The exact point

BELOW we publish the views upon the position created by the French Club, of Mr. S. F. Edge and Mr. Charles Jarrott, who, as leading racing men, will appeal to all interested in the event:—

Mr. S. F. Edge on the new situation.

"Referring to the proposition of the French Automobile Club to promote a motor car race in opposition to the Gordon-Bennett Race, this is stated in several papers to be viewed with satisfaction by the British manufacturers. I cannot help thinking that this is not correct, and judging from the published views I have seen, they appear to me to be the views of English importers of foreign cars, and not the views of English manufacturers.

"Speaking on behalf of Mr. Napier, the first English manufacturer to make British motor cars for competition in the Gordon-Bennett Race, and a continuous manufacturer of such cars for this purpose since 1901, and as the manufacturer of the only British car that ever won the Gordon-Bennett Race, and other International racing competitions both on land and sea, I may say that to the British manufacturer this proposal of the French Automobile Club is one simply made with the idea of helping the French industry, a very proper idea from the Frenchman's point of view, or possibly an Englishman's point of view who lives by the importation of foreign cars, but a very improper one from the British manufacturer's point of view.

"The reason for the French club's move is a very obvious one, the Gordon-Bennett rules provide that each country shall meet in the Gordon-Bennett Race on an equality, each country only having its three best cars. This, from a French manufacturer's point of view, is not good enough, what they wish is to have thirty or forty French cars against every two or three from other countries, as it enormously increases the chance of a French car winning by such a large number starting. This seems to me absolutely against the whole spirit which has raised the Gordon-Bennett Race up to its present high pinnacle as a sporting success. Its present rules exist with the idea of making every country meet in the Gordon-Bennett Race on an equal footing, so as to try and give a good little manufacturing country as much chance as a good big one. The French Club's new race is brought forward with the idea of giving the big manufacturing country a

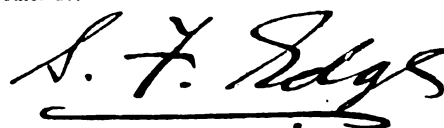
for starting the race has not yet been determined, the original suggestion of the cross roads near Antérioux finding little favour by reason of the distance from Clermont. In all probability La Baraque or la Font-de-l'Arbre, nearer to Clermont, will be selected. The following brief summarised details of the leading features of the circuit serve to give an idea of what will have to be traversed by competitors in the race.

THREE level crossings will be encountered *en route*, one near Lagueuille, another at Bouchet, near St. Ours, and the other about half way between Bouchet and Durtol. The highest point on the route is reached about half-way between Clermont and Massagette, shortly after leaving the Puy de Dôme, the road ascending to an altitude of about 4,000 ft. The course then descends towards the valley of the River Sioulet, but before reaching the river it turns sharply round a corner, marked by a house, at the cross roads near Antérioux. There is a bad corner, too, in Rochefort-Montague, for the road turns sharply to the right round an old manor house before coming to what is probably the worst turning in the whole circuit, where the road makes a complete double on itself. One of the level crossings is then encountered between Lagueuille and Bourg-Lastic, which marks one of the corners of the course. The road is easier after Bourg-Lastic, and is fairly straight going up to Pontamur, just before reaching which place the road turns to the right, after crossing the River Sioulet. From Pontamur to Pontgibaud the route lies along the old National Road which is about 49 ft. wide. The two other level crossings are encountered on this last part of the route which, with the exception of the sharp turn at La Goutelle, is perhaps less difficult than the southern side of the course.

great advantage in a so-called sporting event over the small one, and this, I think, is entirely wrong from a sporting point of view.

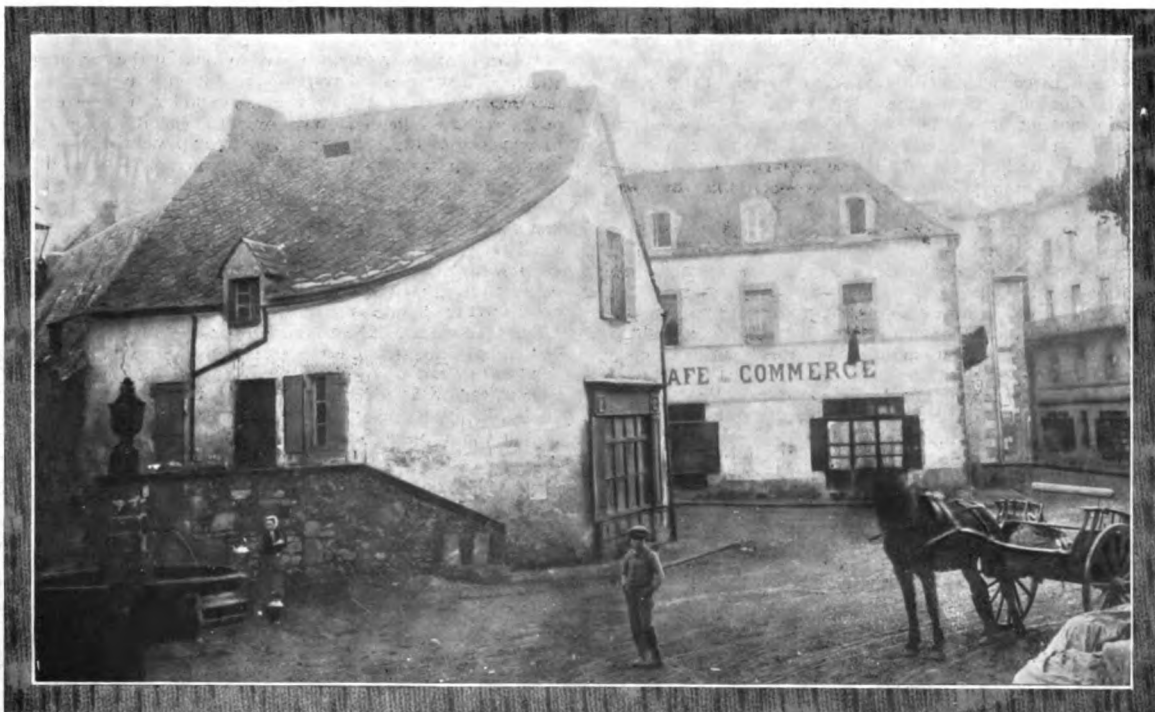
"I see no objection to the race itself providing it is held at some other time than the Gordon-Bennett Race, and if all humbug as to intentions is removed. Let the French Club clearly say, we intend to establish this race for the benefit of French manufacturers, and we have so framed the rules as to give French manufacturers an advantage over every other country. No one can object to this; they have a perfect right to do it. Every country can then compete or not as they like, but do not let us deceive ourselves and pretend in any way that this is a sporting event at all on all fours with the Gordon-Bennett Race from a sporting point of view. It is not, and never will be, anything but what is intended—a French manufacturers' advertising race. The sooner everybody understands this the better.

"I think myself the time has really come when it should be seriously considered whether these long-distance high-speed races with the present heavy racing cars are useful or necessary at all. They have been very useful in the past, but I think under their present rules their utility has entirely passed away, and that either the races should cease, or the rules be amended in such a manner that they tend to the greater improvement of motor car construction than the present rules do.



Mr. Charles Jarrott approves.

"In giving you my views in connection with the suggestion of the French Club holding a big open international race at the same time as the Gordon-Bennett Race, I must firstly say that I cannot see that the proposition is an unjust one to anyone concerned.



GORDON-BENNETT CUP RACE.—An awkward turning in Rochefort.

"We are all perfectly well aware of the history of the Gordon-Bennett Race, and we are aware that prior to the Cup being gained by England, the Gordon-Bennett Race was run at the same time as the big French race of the year. The fact, however, of England gaining the Cup, gave an importance to the race which it had never

previously obtained, and now that France has regained what she previously held, I cannot see that in following out the same procedure in running the race she can be considered as taking an advantage or acting unfairly to the other countries concerned.

"However, I take it that the real question is as to whether a



GORDON-BENNETT CUP RACE.—At the bottom of the hill at the exit from Rochefort, where the worst turning on the route is encountered.

benefit is being obtained or whether there is a great disadvantage in running two big races together, the Gordon-Bennett Race taking a secondary position.

"Let us then in considering this question consider the present position of the Gordon-Bennett Race. It has attained considerable importance in consequence of the last three races, and the result is that in my opinion it has developed into a competition so expensive in the carrying out, and so unwieldy in the handling, as to make it impossible for the race to go on under the present rules with any degree of success.

"A prominent member of the German Club told me in Paris that he hoped and prayed that Germany would not win the Cup this year, as it would practically mean that the German Automobile Club would be bankrupt.

"The experience of our own club on the ground of expense was sufficiently convincing, and I have no doubt that the money which will be spent by the French Automobile Club this year in connection with the Gordon-Bennett Race would be enormous.

"Added to this there is the difficulty of varying the conditions. Everybody who is competing has a right to have representatives, and international jealousy will, in my opinion, effectually prevent any lines being agreed upon between all countries concerned which

been proved to them are beneficial to the development and furthering of the industry.

"To France, therefore, we have to look for the encouraging of the sport. Their roads are available, and it only seems reasonable that the French Club should arrange a race under their own rules which will give their manufacturers the full benefit of the resources of their country. At the same time they have always extended an invitation to other countries to compete, and the result has been stimulation to the world's industry of the greatest importance.

"It may be possible that eventually, through the big race being run under the rules and regulations passed by the French Club, we shall have a much more rational class of racing cars than will ever be possible under the regulations of the Gordon-Bennett Cup Race, merely for the reasons I have before stated; lack of agreement between the countries will prevent any important modifications being made in the existing rules of the Gordon-Bennett Cup.

"It has been said that the great objection to the idea is that the race will be run on a circuit and, therefore, the Gordon-Bennett competitors will be labouring under a very great disadvantage, but surely this is an error, as the chances are equal to all of the competitors, and to suggest that it would be dangerous to run fifty or sixty cars on a big circuit is, to my mind, ridiculous. We have



GORDON-BENNETT CUP RACE.—After leaving Bordas, 6 kiloms. from Rochefort.

will render the race more useful. As the number of countries competing each year becomes more numerous, France has, no doubt, realised that she suffers under a considerable injustice as compared with other countries, that is to say, there are many more manufacturing firms in France than in any other country, and there are many more firms making racing cars, and it seems only fair that with the large interest she has at stake she should be entitled to a better representation than, for instance, Turkey should have if there were one firm in Turkey who could make three cars to represent that country, or Ja. an if some enterprising individual started to manufacture cars in that country.

"No one will question me when I say that our French friends are responsible for motor racing. They started it at the commencement and are as keenly interested at the present time as ever they were in its development. They have manufacturers who are exceedingly eager to compete with each other for supremacy, and, moreover, they have the finest roads in the world for racing, and on top of this the Government, realising the importance of the industry, is always willing to give their sanction to road events which it has

only to refer back to the past to trace the source of accidents in automobile racing to appreciate that racing at the present day, as a matter of fact, is safer than racing two years ago. Firstly, because the manufacturers have more experience in the building of racing cars and the cars themselves are stronger and less liable to break in vital parts and thus cause accidents, and, secondly, because in all the circuit races, as now run, the course is specially treated with Westrumite and the dangers of dust done away with.

"No race could have been more dangerous than the Circuit des Ardennes in 1902, when between fifty and sixty cars competed over a 53 miles circuit, exceedingly dusty and without the course being prepared in any way. It has been said that if a large number of cars are allowed on the course a repetition of the Paris-Madrid Race would be the result. Surely this is a mistake, as the accidents in Paris-Madrid were not due to any causes other than the absurd manner in which the public stood about the road and also to the fact that the dust was very bad, as a straight-away course like Paris-Bordeaux could not be treated with Westrumite from end to end.



GORDON-BENNETT CUP RACE.—A "double" at Bour-Lastic, one of the extreme corners of the course.

"From the point of view of an interesting race undoubtedly the event will be much more interesting from a spectator's point of view than would be the case where there are merely about twenty competitors. Everyone remembers the tedious waiting between the intervals of the cars passing in the Gordon-Bennett Race in Ireland, and also the tedious waits for the same reason in Germany. Very many more cars could have been on the course without danger, and from this point of view alone I see advantages in arranging the two races together.

"Another important point must be borne in mind, and that is, that France, although exceedingly anxious to have a great event of her own, may not be able to arrange for the course to be kept for three days. The eliminating trials have to be arranged for with the assistance of the Government and the military and the civil officials, and it would probably be difficult to arrange for *two* other big events in the year, and from this point of view alone I think the French Club are justified in adopting the course they suggest.

"And finally from the point of view of the British manufacturer, surely we must in England welcome the increased chances we have of doing well in a big international contest. For instance, assuming in the Gordon-Bennett Race there are seven countries competing, making 21 cars, England has on the face of it a 7 to 1 chance. There will probably be 9 cars eliminated in our own Eliminating Trials, that is to say, there will be 9 cars built in England all capable of racing, which will not be competing in any big event having been beaten in the Eliminating Trials. Assuming then that there are, for instance, 60 entries in the big race,

including the 21 Gordon-Bennett competitors, and as no doubt the competitors who were defeated in the English Eliminating Trials for the Gordon-Bennett Cup would enter their cars for the big International Race, England would then have 12 cars competing out of say 60, giving her practically a 5 to 1 chance, which would surely be to her advantage, and at the same time, the various manufacturers who had gone to the expense of thousands of pounds in building racing cars, would have the satisfaction of at least having their cars in the actual event, and having an opportunity to score instead of being eliminated in a trial—not altogether a race—in which they may have done badly merely through bad luck.

"I can see no injustice done to England. On the contrary I can see a benefit accruing from France holding a big open international race, and if in the doing of this she considers it necessary to run the Gordon-Bennett Race at the same time, I think the French Club are not only within their rights, but probably are doing the only thing possible for them in view of the difficulties and expense attendant on arranging a big race separately.

"I have not dealt with the question of individual expense to the competitors, but surely the expense would be considerably less if it were split up between sixty competitors instead of twenty."

Chas. Jarrold



It is a great pity that Reuben Henty, of Cuckfield, had not thought fit to learn the rudiments of motor car driving. A little proficiency in that branch would have saved him from a tragic fate, as he would then have been able to devote himself to driving Post Office vans when motors replace horses for this purpose. As it was, however, he came to the conclusion, being a keeper of the Royal mail horses at Cuckfield, that he would soon be out of employment and destitute, to save himself from which fate he hanged himself in the stables.

We have always championed the cause of the dog, and urged upon all motorists to be particularly considerate to the canine wanderers who sometimes get in their way, and it is only fair in return that dog owners should be careful in the control of their pets, as they frequently give rise to serious accidents. Only recently a Mr. Pounds had his steering gear injured by a dog becoming intimately mixed with it, with the result that Mr. Pounds was thrown out and received internal injuries, to which he ultimately succumbed.

CONSUMPTION TEST OF THE "WHITE" STEAM SYSTEM.

THE following tabulated data obtained by Prof. C. H. Benjamin from a 1903 White model are extremely interesting—not only to automobilists but to engineers generally—on account of the light they throw on the question of superheating as applied to small engines. The brake tests were made on the back axle, so that the engine was driving through its gear as in actual practice. Subsequent tests showed that the total loss from the indicated h.p. to the actual h.p. on the back axle was 2-h.p. at 675 revs. per min., and full load of 11.4-h.p. The column in the accompanying table which gives the *actual* consumption per h.p. must, therefore, be modified by the above data to obtain the water per i.h.p. per hour. The figures thus obtained show a consumption of from 10.8 to 14 lbs. per i.h.p. per hour, which is a very remarkable one in an engine of this size, running non-condensing. The engine is, it will be remembered, of the vertical double-acting compound type, with a high-pressure cylinder 3 ins. diameter, and a low-pressure cylinder 5 ins. diameter, the stroke being $3\frac{1}{2}$ ins.

We append the following interesting remarks which Col. R. E. Crompton, C.B., R.E., M.I.C.E., M.I.M.E., &c., &c., has been good enough to send us in response to our request, and which are of particular value in view of the very wide experience which Col. Crompton has had with the White steam car in particular. He says:—

"I consider that Professor Benjamin's results in the testing of the boiler and engine of the 15-h.p. White car are very remarkable. They have already attracted my close attention, and I have tried to make the figures given fit in with theory, but have failed to do so; that is to say, that although in my mind I have not the least doubt that certain data of the full-load tests, which are the important ones, are correct within 5 per cent., yet I

do not think the temperatures given can be correct, nor do I think that it is possible to account for the high economy with the limited range of temperatures and of the expansion of the steam, which, calculated from the size of the cylinders and the three-quarter cut-off, gives only a $3\frac{1}{2}$ -fold range.

"My view is that the temperature at the engine must have been quite as high as that at the boiler and the temperature of the exhaust somewhat lower than that given, and that there was considerable extra expansion obtained by the throttle-valve, so that the total ratio of expansion, instead of being only $3\frac{1}{2}$ times, must have been about $4\frac{1}{2}$ times. Even then the results, allowing for a reasonable 5 per cent. error in the measurements of the brake-power and a 2 per cent. error in the measurements of gasoline and water, which are the utmost which are likely, are so good as to show that the White engine and boiler is the most remarkable steam engine combination that has ever yet been tested in an authoritative manner. These tests would lead one to suppose that if we start with steam at an initial temperature of 1,000° Fahr. on entering the first cylinder, and expand through three or four cylinders, say through a twenty-fold range, and in addition got a small vacuum, it would be possible, even in these small engines, to get this consumption down to 8 lbs. of steam per i.h.p. per hour, which would be a world's record. At any rate, the figures are of great importance to all who are interested in the question whether the steam engine is going to hold its own with the internal combustion engine for any length of time to come. I have always been one of those who thought that this would be the case, and Benjamin's figures seem to corroborate my view."

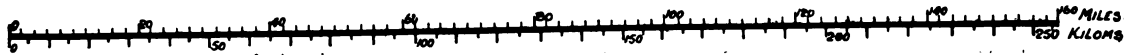
Boiler Pressure, lbs. per sq. in.	Temp. Feed.	Temp. Steam (Boiler).	Temp. Steam (Engine).	Superheat (Boiler).	Superheat (Engine).	Temp. (Exhaust).	Weight, Gasoline, Specific Gravity 0.78.	Weight, Water.	Evap. from and at 212°.	Evap. per lb., Gasoline.	Evap. per sq. ft. H.S. per hour.	Actual Water per H.P. Hour.	Gasoline per H.P. Hour.	*Equiv. Steam per H.P. Hour at 212°.	Brake H.P., Engine Speed 675 revs. per min.	Cut-off (in terms of the stroke).
°F.	°F.	°F.	°F.	°F.	°F.	°F.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
263	51	763	695	353	285	288	6.6	72	109.3	16.6	5.96	12.6	1.16	16.3	11.4	.75
250	47	779	725	373	319	289	6.5	68	104.7	16.1	5.71	14.9	1.42	19.7	9.15	.75
274	47	786	739	369	325	360	6.0	68.2	105	17.5	5.73	19.7	1.74	26.3	6.92	Open
244	47	772	718	368	314	339	5.7	60.5	93	16.3	5.07	17.5	1.65	23.1	6.92	.75
356	48	782	735	345	298	298	5.3	54.5	83.4	15.7	4.55	15.8	1.53	20.4	6.92	.50
388	46	793	726	347	280	293	4.6	46.5	71.4	15.5	3.89	19.9	1.97	25.9	4.66	.50
483	47	796	711	329	244	344	3.0	29.7	45.4	15.1	2.48	24.8	2.5	31.8	2.4	.50
380	47	737	632	294	189	354	2.0	15.7	23.3	11.6	1.27	...	...	...	0.0	.50

* Specific heat of superheated steam for the temperatures used is taken at 0.78 to 0.80.

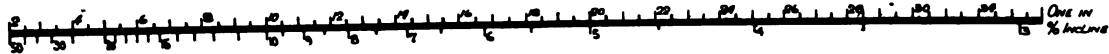


THE extent to which automobilism is influencing the national life was well illustrated recently, when the Lord Mayor gave away the prizes to the Pitman School at the Queen's Hall, Langham Place. Mr. Williams Benn, M.P., who occupied the chair, pointed out how necessary shorthand was to the business man, and that capable business men were the country's greatest need. "Business men," he declared, "were to the country what petrol was to the motor car."

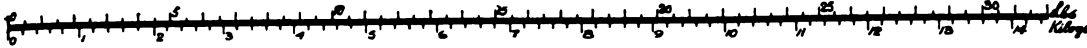
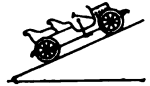
WE have received Willings Press Guide for 1905 which remains the same indispensable publication for the journalist and business man which it has been for so many years past. The features remain the same; an alphabetical list of all the newspapers and magazines of the United Kingdom, followed by alphabetical lists arranged by counties, while main towns in the United Kingdom with the papers published in them follow. The guide is brought up to date, and is as reliable as ever.



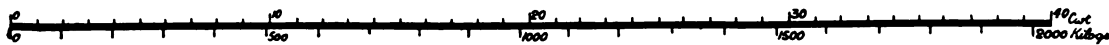
Miles: Kilometres.—Distances up to 160 miles are compared in this Scale in English and French units of measurement. The scale is especially suitable for Touring purposes. Each division above the line represents 2 miles. Each division below the line represents 5 kiloms.



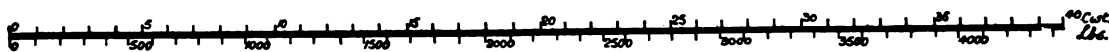
"One In": Per Cent. Incline.—In England, hills are generally expressed as having a rise of "One in" 10 (say); Continental practice, however, is to express the incline as a percentage thus:—(1 in 10 = 10 %).



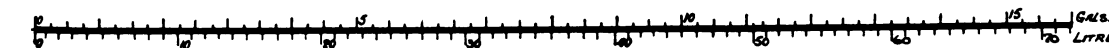
Pounds: Kilogrammes.—The range of this *Weight Scale* makes it suitable for comparing weights such as those which can be conveniently weighed on a spring balance. Each division above the line represents 1/2 lb. Each division below the line represents 0.2 kilog.



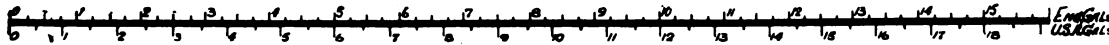
Hundredweights: Kilogrammes.—The weights of cars, and other things, which require a weighbridge for weighing them, can be compared in the English and French units by this scale. Each division above the line represents 1 cwt. Each division below the line represents 100 kilogs.



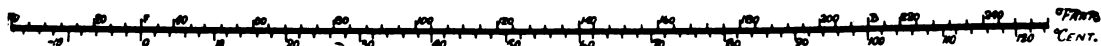
Hundredweights: Pounds.—The awkward relationship between the two British units of weight, the cwt. and the lb., make a scale of comparison very useful. Besides this the American cwt. is equivalent to 100 lbs. instead of 112 lbs., and the American ton is 2,000 lbs. instead of 2,240 lbs. Each division above the line represents 1 cwt. Each division below the line represents 100 lbs. (or 1 U.S.A. cwt.).



Gallons: Litres.—The range of this *Capacity scale* renders it especially suitable for use in comparing the capacities of water and petrol tanks. Each division above the line represents 1/4 gal. (2 pints.). Each division below the line represents the litre (1,000 cm³).



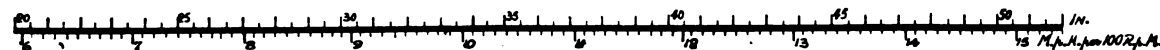
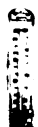
English Gallons: American Gallons.—There is sufficient difference between the respective volumes of the gallon in these two countries to introduce errors of considerable magnitude in calculations based on equality of capacity. Each division above the line represents 1/4 gals. Eng. Each division below the line represents 1/4 gals. U.S.A.



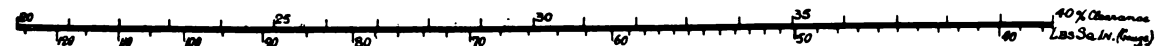
Degrees Fahrenheit: Degrees Centigrade.—The range of this *Temperature Scale* is similar to that of an ordinary thermometer; the Freezing and Boiling Points of Water are indicated by the letters, F and B, respectively. Each division above the line represents 4° Fahr. Each division below the line represents 2° Cent.



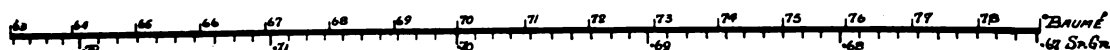
Degrees Fahrenheit: Degrees Centigrade.—For high temperatures, both the Fahrenheit and Centigrade Scales are used in this country, but only the Centigrade Scale is employed on the Continent. Each division above the line represents 100° Fahr. Each division below the line represents 50° Cent.



Tyre Diameter: M.P.H. per 100 R.P.M.—This "Gear-Ratio" Scale shows the speed of a car when the road-wheels revolve at 100 revs. per min. The diameter of the road-wheel is indicated above the line, and the speed of the car—per 100 revs. per min.—is given below the line. Each division above the line represents 1/2 inch. Each division below the line represents 0.1 m.p.h.



Per Cent. Clearance: Pounds per Square Inch (Gauge).—This Scale is constructed to show the compression pressure in the cylinder of a petrol engine, in relationship to the capacity of the combustion chamber relatively to the total capacity of the cylinder together with the combustion chamber. The resulting pressures are gauge pressures, i.e., as shown on an indicator diagram.



Degrees Baumé: Specific Gravity.—In America, as on the Continent, the Baumé Hydrometer is chiefly used for testing the density of petrol. The relationship between Baumé and Specific Gravity (water = 1.00) is approximately given by the formula:— $\text{Specific Gravity} = \frac{144}{134 \times (^\circ\text{Baumé})}$ The divisions above the line represent °Baumé. The divisions below the line represent 0.001 sp. gr.



HEAVY MOTOR CAR REGULATIONS.

Regulations as to Weight, Conditions of Use, Construction and Speed of Heavy Motor Cars.

ARTICLE I.—The Regulations in this Order (hereinafter referred to as "the Regulations") shall come into operation on the first day of March, One thousand nine hundred and five, and that date is hereinafter referred to as the commencement of the Regulations.

Article II.—In the Regulations—

The expression "heavy motor car" means a motor car exceeding two tons in weight unladen.

The expression "trailer" means a vehicle drawn by a heavy motor car.

The expression "registering authority" means, in relation to a heavy motor car, the Council of a County, or the Council of a County Borough, by whom the heavy motor car has been, or can be, registered, in pursuance of the Motor Car Act, 1903, and of the Motor Car (Registration and Licensing) Order, 1903.

The expression "axle-weight" means, in relation to an axle of a heavy motor car, or of a trailer, the aggregate weight transmitted to the surface of the road or other base whereon the heavy motor car or the trailer moves or rests, by the several wheels attached to that axle when the heavy motor car, or the trailer, is loaded.

The expression "registered axle-weight" means, in relation to an axle of a heavy motor car, the axle-weight of that axle, as registered by the registering authority in pursuance of the Regulations.

The expression "width," in relation to the tyre of a wheel, means the distance measured horizontally and in a straight line across the circumference of the wheel and between the two points in the outer surface of the tyre which are farthest apart.

The expression "diameter," in relation to a wheel, means the diameter measured between the two opposite points in the outer surface of the tyre which are farthest apart.

The expression "weight," in relation to a heavy motor car or trailer when unladen, means the weight of the vehicle exclusive of the weight of any water, fuel, or accumulators used for the purpose of propulsion.

Increase of weights, unladen.—Article III.—Notwithstanding anything in the Motor Car Acts, 1896 and 1903, and except as is otherwise provided in the Regulations, a heavy motor car may be used on a highway if the weight of the heavy motor car unladen does not exceed five tons, or if the weight of the heavy motor car unladen with the weight of an unladen vehicle drawn by it does not exceed six and a half tons.

Registration of Weights.—Article IV.—1. On every application to a registering authority for the registration of a heavy motor car, the owner shall declare—

- (a) The weight of the heavy motor car unladen;
- (b) The axle-weight of each axle; and
- (c) The diameter of each wheel.

2.—(a) Before a heavy motor car is registered, the weight of the car unladen, and, if the registering authority so direct, the axle-weight of each axle of the car shall be ascertained by or in the presence of an officer of the registering authority. That officer shall certify the weight or weights so ascertained, and shall make any necessary correction in the statement of weights declared by the owner.

(b) The officer of the registering authority shall also satisfy himself that the tyres of the wheels of the car, if the tyres are not pneumatic, or are not made of a soft or elastic material, are of the dimensions required by the Regulations.

(c) The owner of a heavy motor car shall, for the purposes of this condition, cause the motor car to be driven or brought to any such place as the registering authority appoint.

3. Upon the registration of a heavy motor car—

- (a) the weight of the heavy motor car unladen, as certified as aforesaid,
- (b) the axle-weight of each axle,
- (c) the diameter of each wheel,
- (d) the width and material of the tyre of each wheel, and
- (e) the highest rate of speed at which, in conformity with the Regulations, the heavy motor car may be driven without a trailer,

shall be entered in the Register of Motor Cars.

4. Upon receiving from the registering authority a copy of the entries made in the register relating to a heavy motor car, the owner of the heavy motor car shall cause—

- (i) the registered weight of the heavy motor car unladen,

- (ii) the registered axle-weight of each axle, and

- (iii) the highest rate of speed at which, in conformity with the Regulations, the heavy motor car may be driven without a trailer,

to be painted, or otherwise plainly marked, in the first and second case, upon some conspicuous part of the right or off side of the heavy motor car, and, in the third case, upon some conspicuous part of the left or near side of the heavy motor car.

The owner of the heavy motor car shall cause the aforesaid particulars to be painted or marked in letters and figures not less than one inch in height, and of such shape and colour as to be clearly legible and clearly distinguishable from the colour of the ground whereon the letters and figures are painted or marked; and he shall cause all the paint or marking to be from time to time repaired or renewed, as often as may be necessary to keep the said letters and figures clearly legible and clearly distinguishable.

5. The owner of a heavy motor car which has been registered before, and which is in use at, the commencement of the Regulations, shall, within six months thereafter, either cause the heavy motor car to be registered anew, or shall cause the heavy motor car to be brought before an officer of the registering authority with whom the heavy motor car has been already registered.

In either case the procedure prescribed by this Article shall be followed with respect to the heavy motor car as if it were a heavy motor car the owner whereof is for the first time an applicant for registration; but in the latter case no registration fee shall be charged by the registering authority in respect of the heavy motor car, or in respect of the procedure prescribed by this Article; and in the case of a heavy motor car the weight of which, when unladen, exceeds five tons but does not exceed seven tons, and which has been registered before the first day of September, One thousand nine hundred and four, compliance with the procedure prescribed by this Article shall, notwithstanding any other provision of the Regulations, have effect as a sufficient authority for the use of the heavy motor car on a highway.

The registering authority shall furnish the owner of a heavy motor car with a certificate in an appropriate form, to the effect that the procedure prescribed by this Article has been followed, and that the heavy motor car may be used on a highway without further registration.

On the expiration of six months from the commencement of the Regulations, a heavy motor car which has been registered before the commencement of the Regulations, and in respect of which the procedure prescribed by this Article has not been followed shall not, except for the purpose of being registered, be used on any highway until the heavy motor car has been registered anew; and all previous registration of the heavy motor car shall cease to have effect.

6. Nothing in the Regulations shall have effect so as to require the registering authority to register a heavy motor car which does not in all particulars satisfy each condition rendered applicable by the Regulations to the heavy motor car or in respect of which there has been a failure to comply with the procedure prescribed by this Article.

Axle-Weights.—Article V.—1. The axle-weight of an axle of a heavy motor car shall not exceed the registered axle-weight.

2. The registered axle-weight of an axle of a heavy motor car shall not exceed eight tons, and the sum of the registered axle-weights of all the axles of a heavy motor car shall not exceed twelve tons.

Tyres.—Article VI.—1. The tyre of each wheel of a heavy motor car shall be smooth, and shall, where the tyre touches the surface of the road or other base whereon the heavy motor car moves or rests, be flat:

Provided that the edges of the tyre may be bevelled or rounded to the extent in the case of each edge of not more than half an inch:

Provided also that, if the tyre is constructed of separate plates, the plates may be separated by parallel spaces which shall be disposed throughout the outer surface of the tyre so that nowhere shall the aggregate extent of the space or spaces in the course of a straight line drawn horizontally across the circumference of the wheel exceed one-eighth part of the width of the tyre.

2. The width of the tyre of each wheel of a heavy motor car shall be determined by such of the following conditions as may apply to the circumstances of the case; that is to say,—

- (a) The width shall in every case be not less than five inches.
- (b) The width shall be not less than that number of half inches which is equal to the number of units of registered axle-weight of the axle to which the wheel is attached.

The unit of registered axle-weight shall vary according to the diameter of the wheel, and the rules set forth in the subjoined scale; that is to say—

- (i.) If the wheel is three feet in diameter, the unit of registered axle-weight shall be seven and a half hundredweights;
- (ii.) If the wheel exceeds three feet in diameter, the unit of registered axle-weight shall be seven and a half hundredweights, with an addition of weight in the proportion of one hundredweight for every twelve inches by which the diameter is increased beyond three feet; and in the same proportion for any increase which is greater or less than twelve inches; and
- (iii.) If the wheel is less than three feet in diameter, the unit of registered axle-weight shall be seven and a half hundredweights, with a deduction of weight in the proportion of one hundredweight for every six inches by which the diameter is reduced below three feet; and in the same proportion for any reduction which is greater or less than six inches.

3. This Article shall not apply to any tyre which is pneumatic or which is made of a soft or elastic material.

Speed.—Article VII.—The speed at which a heavy motor car is driven on any highway shall not exceed eight miles an hour:

Provided that—

- (a) If the weight of the heavy motor car unladen exceeds three tons; or
- (b) If the registered axle-weight of any axle exceeds six tons; or
- (c) If the heavy motor car draws a trailer.

the speed shall not exceed five miles an hour.

Provided also that—

If the heavy motor car has all its wheels fitted with pneumatic tyres or with tyres made of a soft or elastic material, the speed at which the heavy motor car may be driven on any highway shall not exceed—

- (a) Twelve miles an hour—Where the registered axle-weight of any axle does not exceed six tons; and
- (b) Eight miles an hour—Where the registered axle-weight of any axle exceeds six tons.

Size of Wheels.—Article VIII.—The diameter of a wheel of a heavy motor car, if the wheel is fitted with a tyre which is not pneumatic or is not made of a soft or elastic material, shall be not less than two feet.

Width.—Article IX.—Notwithstanding anything in the Motor Cars (Use and Construction) Order, 1904, a heavy motor car, if its weight unladen is three tons or exceeds three tons, and any trailer drawn by any such heavy motor car may, when measured between its extreme projecting points, be of a width not exceeding seven feet six inches.

Springs.—Article X.—Every heavy motor car shall be constructed with suitable and sufficient springs between each axle and the frame of the heavy motor car.

Trailer.—Article XI.—1. The owner of a trailer shall cause to be painted, or otherwise plainly marked, upon some conspicuous part of the right or off side of the trailer, in letters and figures not less than one inch in height, and of such shape and colour as to be clearly legible and clearly distinguishable from the colour of the ground whereon the letters and figures are painted or marked—

- (a) The weight of the trailer unladen; and
- (b) The axle-weight of each axle of the trailer, if the weight of the trailer unladen exceeds one ton.

He shall cause the paint or marking to be from time to time repaired or renewed, as often as may be necessary to keep the said letters and figures clearly legible and clearly distinguishable.

2. The Regulations so far as they relate to the width of the tyres and the size of the wheels of a heavy motor car, the wheels whereof are fitted with tyres which are not pneumatic or are not made of a soft or elastic material, shall, with the necessary modifications, apply and have effect with respect to a trailer exceeding one ton in weight unladen, with the substitution in the Regulations of three inches for five inches as the minimum width of the tyres, and of references to the axle-weights painted or marked upon the trailer in pursuance of this Article for references to registered axle-weights.

3. The axle-weight of an axle of a trailer shall not exceed four tons.

4. Every trailer shall be constructed with suitable and sufficient springs between each axle and the frame of the trailer.

5. A heavy motor car which is used either as a stage carriage or otherwise for the conveyance of passengers for gain or hire, shall not draw a trailer.

Ascertainment of Weights by Officers of Councils.—Article XII. If a heavy motor car is upon a highway within a distance not exceeding half a mile by road from a public weighing machine, or other weighing machine which is conveniently accessible, and which belongs to or is subject to the control, or may be used for any purposes of a registering authority, or of any other Council having control of the highway, and a duly authorised officer of the registering authority or other Council has reasonable ground for ascertaining

whether the axle-weight for the time being of any axle of the heavy motor car, or of the trailer drawn by the heavy motor car, exceeds the registered or marked axle-weight of that axle, the officer may require the person driving or in charge of the heavy motor car to drive the heavy motor car with or without the trailer, or to cause the heavy motor car to be driven with or without the trailer to the weighing machine, and the said officer may then cause the axle-weight for the time being of any axle to be ascertained; and the person driving or in charge of the heavy motor car shall comply with any such requirement, and shall, to the best of his ability, afford all such facilities as may be reasonably necessary for the purpose of ascertaining the axle-weight as aforesaid.

Breach of Regulations. Saving for Existing Heavy Motor Cars.

—Article XIII.—No person shall cause or permit to be used on any highway, or shall on any highway drive or have charge of, a heavy motor car or a trailer which is not in all respects in accordance with the regulations so far as they relate to the use and construction of heavy motor cars or trailers, as the case may be, or which is so used or driven as to contravene the Regulations:

Provided that during a period of six months after the commencement of the Regulations any failure to comply with the Regulations so far as they relate to the use or construction of heavy motor cars or trailers shall not be deemed to be a breach or contravention of the Regulations, if the failure occurs solely in relation to a heavy motor car registered before, or to a trailer which is in use at, the commencement of the Regulations.

Use of Heavy Motor Cars on Bridges.—Article XIV.—1. Where any person who is liable to the repair of a bridge forming part of a highway affixes or sets up, in suitable and conspicuous positions, on the bridge and in each approach to the bridge, notices which, as regards all their contents or subject matter, will be clearly and distinctly legible and visible by persons approaching or being on the bridge, and as regards shape, size, colour, and all other characteristics will be clearly distinguishable from other notices placed on the bridge, and which state that the bridge is insufficient to carry a heavy motor car the registered axle-weight of any axle of which exceeds three tons or any greater weight which shall be specified in the notices, the owner of any such heavy motor car shall not cause or suffer the heavy motor car to be driven, and the person driving or in charge of the heavy motor car shall not drive the heavy motor car upon the bridge except with the consent of the person liable to the repair of the bridge:

Provided that where a dispute or difference arises in relation to the insufficiency of the bridge to carry any such heavy motor car, and, on a reference by the person liable to the repair of the bridge and the owner of the heavy motor car, the award or determination of an arbitrator or arbitrators or umpire adjudges the bridge to be sufficient to carry a heavy motor car the registered axle-weight of any axle of which exceeds any weight specified in the notices, this Article shall cease to apply or have effect as regards any such heavy motor car, and the person liable to the repair of the bridge shall forthwith remove every notice affixed or set up in pursuance of this Article:

Provided also that if, within a period of one month, after a request in writing by the owner of any such heavy motor car, the person liable to the repair of the bridge neglects or refuses to become a party to the submission of the dispute or difference to arbitration, or, having become a party to the submission, neglects or refuses to concur in the appointment of an arbitrator, or to appoint an arbitrator or an umpire or third arbitrator according as the submission or any agreement between the parties may require, this Article shall cease to apply or have effect so as to prohibit the driving of any such heavy motor car upon the bridge; and the person liable to the repair of the bridge shall forthwith remove every notice affixed or set up in pursuance of this Article:

Provided further that, notwithstanding anything in the foregoing proviso, the person liable to the repair of the bridge may, in substitution for the notices previously affixed or set up, affix or set up in accordance with this Article notices specifying some axle-weight greater than that to which any award or determination mentioned in this Article has had relation; and that thereupon this Article shall apply and have effect with respect to the substituted notices, and with respect to any other matter or thing to which this Article refers as it has applied and had effect with respect to the notices previously affixed or set up, and with respect to any such other matter or thing, prior to the affixing or setting up of the substituted notices.

2. The owner of a heavy motor car the axle-weight of any axle of which exceeds six tons shall not cause or suffer the heavy motor car to be driven, and the person driving or in charge of the heavy motor car shall not drive the heavy motor car upon a bridge forming part of a highway at any time when another heavy motor car, or a locomotive to which the Locomotives Act, 1898, applies, is on the bridge.

Register of Motor Cars.—Article XV.—1. The Motor Car (Registration and Licensing) Order, 1903, shall, with the necessary modifications, apply and have effect so as to provide that for the purpose of the registration of heavy motor cars there shall be a separate part in the Register of Motor Cars, and that the separate part shall be in the Form A, set out in the Schedule to this Order or in a form to the like effect; and that to the Form of particulars to be furnished by an applicant for registration of a heavy motor car, there shall, for the purpose of enabling the applicant to declare—

- (a) the weight of the heavy motor car unladen,
- (b) the axle weight of each axle, and
- (c) the diameter of each wheel,

be added the particulars shown in the Form B set out in the said Schedule.

2. In every case in which, after prior registration, the procedure prescribed by Article IV. in relation to such a case has been followed, the registering authority shall cause the entry of prior registration to be erased, and such entries as are required in compliance with the procedure prescribed by Article IV. to be made in the appropriate columns of the separate part in the Register of Motor Cars.

Application of earlier Orders as to Motor Cars.—Article XVI.—As regards matters which are not hereinbefore expressly mentioned in relation to heavy motor cars, the Motor Car (Registration and Licensing) Order, 1903, and the Motor Cars (Use and Construction) Order, 1904, shall apply and have effect subject to the Regulations; and any provisions of either Order which are inconsistent with the Regulations shall cease to apply and have effect in relation to a heavy motor car.

Military Motor Cars.—Article XVII.—The Regulations, in relation to any heavy motor car which belongs to His Majesty the King, and is used for the time being under the care, superintendence, or control of a Secretary of State, for military purposes, shall apply and have effect—

- (a) As if, in Article III. of this Order, "six tons" were substituted for "five tons," and "eight tons" were substituted for "six and a half tons," and

- (b) As if, to subdivision (1) of Article VI. of this Order, there were added the following words, that is to say,—

"Provided further that if the tyre is constructed, shod, or fitted with diagonal crossbars, the conditions of this Article shall for the purpose of determining the width of the tyre, apply subject to the substitution throughout those conditions of five hundredweights for seven and a half hundredweights as the unit of registered axle-weight."

Article XVIII.—This Order may be cited as the Heavy Motor Car Order, 1904.

FORM A.—Register of Heavy Motor Cars.

County [or County Borough] of _____.

1. Index mark and number on identification plates.
2. Full name of owner and postal address of his usual residence.
3. Description or type of car.
4. Type and colour of body of car.
5. Weight unladen.
6. Axle-weight of each axle.
7. Diameter of wheels.
8. Width and material of tyres.
9. Maximum speed permissible.
10. Whether intended for—
 - (a) Private use.
 - (b) Use for trade purposes.
 - (c) Use as a public conveyance.
11. Date of registration.
12. If cancelled, date of cancellation.

FORM B.—Declaration to be added before the words "*Signature of owner or person applying on his behalf*" at the foot of the form in the Third Schedule to the Motor Car (Registration and Licensing) Order, 1903.

I hereby declare that the following particulars in relation to the heavy motor car to which my application relates are true to the best of my knowledge and belief:—

- Weight of heavy motor car unladen.
- Axle-weight of each axle.
- Diameter of each wheel.

Points in the Circular Letter Issued by the L.G.B. to the Councils of Counties and County Boroughs in regard to the Clauses of their New Regulations under the Motor Car Acts, 1896 and 1903, in relation to Heavy Motor Cars.

Outline of Regulations.

Hitherto the weight of a motor car, unladen, has been legally limited to 3 tons. This limit is now raised to 5 tons. At the same time a corresponding increase is made in the limit on the joint weight (unladen) of the motor car and trailer, namely, from 4 tons to 6½ tons. See Article III.

Up to the present time no limit has been placed by law on the weight permissible in the load on a motor car, but an innovation in this respect is made by the regulations, as it has been generally accepted that an increase in the tare weight of motor vehicles ought to be accompanied by the adoption of some safeguard against an excessive total moving load. The regulations, therefore, make the use of the heavier form of motor vehicle upon the roads legally dependent upon the observance of limitations, not merely on the weight unladen, but on the total joint weight of the load and the car. For convenience of designation, all motor cars exceeding 2 tons in weight (unladen) are grouped together by the regulations under the description of "heavy motor cars," and the joint weight of any heavy motor car together with its load is restricted in the following respects.

In the first place, the total weight of car and load is limited to 12 tons. Next, the weight borne on any axle is not to exceed 8 tons. Thirdly, the weight on any axle at any time is not to be allowed to go beyond the weight accepted, as for that axle, at the time of the registration of the car (such accepted weight for the axle being termed the "registered axle-weight"). See Article V. As to the relationship between the above-mentioned limitations of 12 tons and 8 tons, it is to be borne in mind that the greater part of any load, approximating to two-thirds of the whole, may ordinarily be expected to be carried on the axle to which the driving power is directly applied.

The question of the character and dimensions of tyres suitable for heavy motor cars was fully considered by the Departmental Committee, it being felt that the admissibility of a new form of heavy traffic on highways greatly depended upon the arrangements which could be made for minimising wear and tear of the roads. Special and detailed provision is made by Article VI. of the regulations for the purpose of securing a width of tyre duly proportionate to the moving load and the size of the wheels, in cases where the wheels are fitted with ordinary tyres, *i.e.*, tyres which are not pneumatic or

are not made of a soft or elastic material. No ordinary tyre is, however, to be less than 5 inches in width. The scale of sizes is laid down in the Article, and tables, fully showing the operation of the scale as regards different sizes of wheels and different axle-weights, are contained in an exemplification which the Board have caused to be prepared. As instances of the scale, it may be mentioned that, in the case of a wheel of 3 feet in diameter attached to an axle with an axle-weight of 6 tons, the tyre would have to be 8 inches in width, whilst for a similar weight on a wheel 5 feet in diameter the width of tyre would be 6½ inches.

Where pneumatic tyres or tyres made of a soft or elastic material are used, the width is not prescribed by the regulations, as the practical necessities in such cases will doubtless be enough to secure the selection of tyres of suitable strength and durability and hence of adequate size.

The regulations contain other minor provisions and requirements as to the construction and use of heavy motor cars. In the case of any wheel with an ordinary tyre, the diameter is not to be less than 2 feet (Article VIII.); all heavy motor cars are to have suitable and sufficient springs between the axles and the frame (Article X.); in regard to ordinary tyres, although a smooth surface is usually required, the method of tyreing wheels by strips of metal with intervals between them is, subject to definite conditions laid down in Article VI., not excluded; and cars with a weight unladen amounting to 3 tons or more are allowed a width of 7 feet 6 inches (Article IX.).

Under the special powers of Section 12 of the Motor Car Act, 1903, the rate of speed allowed to motor cars generally by the Act is considerably reduced by the regulations in the case of all heavy motor cars.

A heavy motor car is restricted to a speed of 8 miles an hour, or to 5 miles an hour if the car exceed in weight 3 tons unladen or has any axle with an axle-weight exceeding 6 tons or draws a trailer; but to this rule there are exceptions allowing somewhat higher speeds to cars having pneumatic tyres or other tyres of a soft or elastic material. See Article VII.

With respect to vehicles ("Trailers") drawn by heavy motor cars, certain provisions are included, as will be seen from the regulations, which in several respects are based on those relating to the cars themselves; but there are some special requirements in Article XI. as to trailers. The axle-weight on any axle of a trailer

is limited to 4 tons. If the trailer exceeds a ton in weight unladen, the provision as to the proportionate width of tyres applies; but a minimum width of 3 inches is allowed. A trailer is not allowed to be drawn by any motor car used as a stage carriage, or for the conveyance of passengers for gain or hire. A trailer does not require registration.

For the purpose of securing that heavy motor cars shall duly comply with the new requirements as to construction and fittings, some additional provisions have been made with regard to the process of registration. The owner when applying for the registration of a heavy motor car is to declare (a) the weight unladen, (b) the axle-weight of each axle, and (c) the diameter of each wheel. Before registration, the weight unladen and (if the registering authority so direct) the axle-weight of each axle are to be ascertained by or in the presence of an officer of the authority. He is to certify the results, and if necessary correct the owner's statement. He is also to satisfy himself whether the tyres (if not pneumatic or not made of soft or elastic material) are of the prescribed dimensions, *i.e.*, of the width required, having regard to the size of the wheels and the axle-weight. For the above purpose the car is required to be driven or brought to the place appointed by the registering authority. Detailed entries of the facts relating to the particular car are to be made in the Register of Motor Cars. A new and separate part of the Register in which the entries relating to a heavy motor car are to be made is prescribed by Article XV. of the regulations.

It will devolve on the registering authority, under Article III. of the Motor Car (Registration and Licensing) Order, 1903, to furnish the owner of a heavy motor car with a copy of the entries in the Register relating to the car; and upon receiving a copy of these entries the owner is to cause the unladen weight, the axle-weight of each axle, and the highest permissible rate of speed under the regulations for the particular car to be painted or otherwise plainly marked on the sides of the car in the manner specified in the regulations, the marking of the weights being placed on the right side, and the marking of the speed on the left. It is suggested that the weights and speeds might be thus indicated:—

The unladen weight	...	...	U.W.	tons.
Registered axle-weight of each axle	A.W.	tons.	cwt.	
Maximum speed permissible (in miles per hour)	...	...	Speed	m. p.h.

With regard to existing cars coming within the definition of "heavy motor car," it has been found necessary to include certain additional regulations. The regulations, generally, come into force on the first day of March next. The saving, however, in Article XIII. provides a period of grace of six months from that date for heavy motor cars registered before that date, the object of the saving being to allow time for cars to be brought up before the registering authority, and for any structural alterations to be made which may be necessary so to alter the cars as to secure that they shall comply with the regulations. The period allowed will avoid an inconveniently sudden disuse as motor cars of any vehicles which cannot properly be altered.

A further provision, however, is made by Article IV. (5), in order to meet the case of existing cars. Every heavy motor car registered before the date of operation of the regulations must, within six months, be brought before an officer of the registering authority with whom it has been already registered, or must be registered anew, its existing registration being cancelled; and in either case the same procedure must be followed as in the case of a first registration of a heavy motor car under the regulations. The provisions as to weight unladen, axle-weight and tyres will apply as fully as in the case of a new car. But if a car which was registered before the 1st September, 1904, and which has, when unladen, a weight exceeding five tons but not exceeding seven tons, is brought before an officer of the registering authority, and the prescribed procedure followed, compliance with this regulation is to be sufficient authority for the use of the particular car upon the highway.

In every case in which a heavy motor car is brought up for inspection and not registered anew a certificate of the facts is to be given by the registration authority to the owner, to serve as evidence of the right to use the car. After six months, the previously-existing registration of any heavy motor car in respect of which no such certificate has been given will cease to have any effect.

Article XII. of the Order contains provisions enabling the officer of any local authority having control of the highway, or of any registering authority, to test the weight of the actual load for the time being on any heavy motor car. The power, however, can only be used if the car is upon a highway within half a mile by road from a public weighing machine or other weighing machine which is conveniently accessible.

With respect to bridges, Article XIV. provides for notices being placed on any bridge forming part of a highway, and in each approach to the bridge, with a view of prohibiting the passage over

the bridge of any heavy motor car with a registered axle-weight exceeding three tons on any axle, or with a higher axle-weight to be specified in the notices. Where such notices are placed, cars of the class referred to are not to be driven upon the bridge except with the consent of the person liable to repair the bridge. In the event of disputes arising as to the insufficiency of any bridge to carry the traffic specified in the notices, the Article provides for the settlement of the matter by resort to arbitration.

The same Article prohibits heavy motor cars, where the axle-weight of any axle exceeds six tons, from being driven on a bridge forming part of a highway, if another heavy motor car, or an ordinary road locomotive (*e.g.*, a traction engine) is on the bridge at the time.

Subject to the new regulations, the existing regulations contained in the Motor Car (Registration and Licensing) Order, 1903, and the Motor Cars (Use and Construction) Order, 1904, will continue to apply as regards all matters not expressly mentioned in the new regulations. The new regulations are, like the previous regulations, made under Section 6 of the Locomotives on Highways Act, 1896, and consequently any breach of them will be punishable by a fine not exceeding £10.

In addition to the foregoing statement of the effect of the new regulations, the Board think it well to add the following observations.

As regards the meaning to be attached to the expression "weight" when applied to a heavy motor car or trailer unladen, the question has been raised whether a new definition of "weight" should be substituted for that hitherto employed, so as to determine more exactly what separate or detachable parts or fittings may properly be excluded from, or included within, the scope of the above expression. The present definition of "weight," however, follows in its terms the language of Sub-section (2) of Section (1) of the Act of 1896; and the Board have not thought it desirable to depart from that language. All that the sub-section requires is that in calculating the weight of a vehicle unladen, the weight of any water fuel or accumulators used for the purpose of propulsion shall be excluded. The expression "weight" when applied to a motor car or trailer unladen, therefore, does not in itself determine what can be regarded as part of the vehicle, and what can be regarded as part of the load; and it appears to the Board that whilst any essential part of the vehicle or its mechanism is clearly included in calculating the unladen weight, the circumstances of construction may in certain cases permit of a detachable framework or body being treated as part of the load rather than of the car itself.

The requirement as to the ascertainment of weights, prior to registration, by or in the presence of an officer of the registering authority, is intended to supply an opportunity for testing the accuracy of the facts declared by the owner. The precise steps, however, to be taken by the officer for this purpose are not set forth in the regulations; and, as regards the ascertainment of the axle-weights, the officer is not bound to act under the regulations except upon the direction of the registering authority. The necessity for greater or less severity in the tests applied will, of course, in practice depend on whether some limit of weight is approached which has to be regarded for a special purpose, such as load, tyres, or speed. Especial care should be taken in any case where the exact weight would affect a structural detail or a permanent marking on the car. In relation to the acceptance of the declared axle-weights, the principal point requiring attention will be that the total of the axle-weights fairly represents the joint weight of the car and of the maximum load which it may be expected to carry.

In connection with the provisions of Article XII., it has been suggested that if an officer of a Council acts under it and finds that the axle-weight for the time being is within the proper limit, the Council should be required to make good and pay for any loss of time occasioned by the action of their officer; but the Board are advised that it is not legally competent to them to include a provision of this nature in the present regulations. This circumstance, amongst others, has led the Board to restrict the operation of the Article to cases where the heavy motor car is within half a mile from an available weighing machine.

It is desirable that the Council should proceed to have the needful forms prepared for the new part of the Motor Car Register which is to be appropriated for heavy motor cars. It would be convenient if, before the regulations come into force, the Council sent a notice to the owner of every motor car already registered with them the weight of which as entered in the Register exceeds two tons. The notice should state that the new regulations apply to all motor cars exceeding two tons in weight unladen, and that, as already mentioned, such cars must within six months either be registered anew, or must be brought up for inspection and for variation of the registration in compliance with the procedure prescribed by Article IV. of the regulations. It should be pointed out that if the owner prefers to register anew with another registering authority,

Table I.

WHEEL DIAMETER—2 feet.
(Unit of reg. axle weight 5½ cwt.)

Axle weight.	Tyre
From	To
A.—Heavy Motor Cars.	
tons cwt.	inches.
—	2 15
2 15	3 0½
3 0½	3 6
3 6	3 11½
3 11½	3 17
3 17	4 2½
4 2½	4 8
4 8	4 13½
4 13½	4 19
4 19	5 4½
5 4½	5 10
5 10	5 15½
5 15½	6 1
6 1	6 6½
6 6½	6 12
6 12	6 17½
6 17½	7 3
7 3	7 8½
7 8½	7 14
7 14	7 19½
7 19½	8 0
B.—Trailers only.	
—	1 13
1 13	1 18½
1 18½	2 4
2 4	2 9½
2 9½	2 15
2 15	3 0½
3 0½	3 6
3 6	3 11½
3 11½	3 17
3 17	4 0

Table II.

WHEEL DIAMETER—2 ft. 3 in.
(Unit of reg. axle weight 6 cwt.)

Axle weight.	Tyre
From	To
A.—Heavy Motor Cars.	
tons cwt.	inches.
—	3 0
3 0	3 6
3 6	3 12
3 12	3 18
3 18	4 4
4 4	4 10
4 10	4 16
4 16	5 2
5 2	5 8
5 8	5 14
5 14	6 0
6 0	6 6
6 6	6 12
6 12	6 18
6 18	7 4
7 4	7 10
7 10	7 16
7 16	8 0
B.—Trailers only.	
—	1 16
1 16	2 2
2 2	2 8
2 8	2 14
2 14	3 0
3 0	3 6
3 6	3 12
3 12	3 18
3 18	4 0

Table III.

WHEEL DIAMETER—2 ft. 6 in.
(Unit of reg. axle weight 6½ cwt.)

Axle weight.	Tyre
From	To
A.—Heavy Motor Cars.	
tons cwt.	inches.
—	3 5
3 5	3 11½
3 11½	3 18
3 18	4 4½
4 4½	4 11
4 11	4 17½
4 17½	5 4
5 4	5 10½
5 10½	5 17
5 17	6 3½
6 3½	6 10
6 10	6 16½
6 16½	7 3
7 3	7 9½
7 9½	7 16
7 16	8 0
B.—Trailers only.	
—	1 19
1 19	2 5½
2 5½	2 12
2 12	2 18½
2 18½	3 5
3 5	3 11½
3 11½	3 18
3 18	4 0

Table V.

WHEEL DIAMETER—3 feet.
(Unit of reg. axle weight 7½ cwt.)

Axle weight.	Tyre
From	To
A.—Heavy Motor Cars.	
tons cwt.	inches.
—	3 15
3 15	4 2½
4 2½	4 10
4 10	4 17½
4 17½	5 5
5 5	5 12½
5 12½	6 0
6 0	6 7½
6 7½	6 15
6 15	7 2½
7 2½	7 10
7 10	7 17½
7 17½	8 0
B.—Trailers only.	
—	2 5
2 5	2 12½
2 12½	3 0
3 0	3 7½
3 7½	3 15
3 15	4 0

Table VI.

WHEEL DIAMETER—3 ft. 3 in.
(Unit of reg. axle weight 7½ cwt.)

Axle weight.	Tyre
From	To
A.—Heavy Motor Cars.	
tons cwt.	inches.
—	3 17½
3 17½	4 5½
4 5½	4 13
4 13	5 0½
5 0½	5 8½
5 8½	5 16½
5 16½	6 4
6 4	6 11½
6 11½	6 19½
6 19½	7 7½
7 7½	7 15
7 15	8 0
B.—Trailers only.	
—	2 6½
2 6½	2 14½
2 14½	3 2
3 2	3 9½
3 9½	3 17½
3 17½	4 0

Table VII.

WHEEL DIAMETER—3 ft. 6 in.
(Unit of reg. axle weight 8 cwt.)

Axle weight.	Tyre
From	To
A.—Heavy Motor Cars.	
tons cwt.	inches.
—	4 0
4 0	4 8
4 8	4 16
4 16	5 4
5 4	5 12
5 12	6 0
6 0	6 8
6 8	6 16
6 16	7 4
7 4	7 12
7 12	8 0
B.—Trailers only.	
—	2 8
2 8	2 16
2 16	3 4
3 4	3 12
3 12	4 0

Table VIII.

WHEEL DIAMETER—3 ft. 9 in.
(Unit of reg. axle weight 8½ cwt.)

Axle weight.	Tyre
From	To
A.—Heavy Motor Cars.	
tons cwt.	inches.
—	4 2½
4 2½	4 10½
4 10½	4 19
4 19	5 7½
5 7½	5 15½
5 15½	6 3½
6 3½	6 12
6 12	7 0½
7 0½	7 8½
7 8½	7 16½
7 16½	8 0
B.—Trailers only.	
—	2 9½
2 9½	2 17½
2 17½	3 6
3 6	3 14½
3 14½	4 0

Table IX.

WHEEL DIAMETER—4 feet.
(Unit of reg. axle weight 8½ cwt.)

Axle weight.	Tyre
From	To
A.—Heavy Motor Cars.	
tons cwt.	inches.
—	4 5
4 5	4 13½
4 13½	5 2
5 2	5 10½
5 10½	5 19
5 19	6 7½
6 7½	6 16
6 16	7 4½
7 4½	7 13
7 13	8 0
B.—Trailers only.	
—	2 11
2 11	2 19½
2 19½	3 8
3 8	3 16½
3 16½	4 0

Table X.

WHEEL DIAMETER—4 ft. 3 in.
(Unit of reg. axle weight 8½ cwt.)

Axle weight.	Tyre
From	To
A.—Heavy Motor Cars.	
tons cwt.	inches.
—	4 7½
4 7½	4 16½
4 16½	5 5
5 5	5 13½
5 13½	6 2½
6 2½	6 11½
6 11½	7 0
7 0	7 8½
7 8½	7 17½
7 17½	8 0
B.—Trailers only.	
—	2 12½
2 12½	3 1½
3 1½	3 10
3 10	3 18½
3 18½	4 0

Table XI.

WHEEL DIAMETER—4 ft. 6 in.
(Unit of reg. axle weight 9 cwt.)

Axle weight.	Tyre
From	To
A.—Heavy Motor Cars.	
tons cwt.	inches.
—	4 10
4 10	4 19
4 19	5 8
5 8	5 17
5 17	6 6
6 6	6 15
6 15	7 4
7 4	7 13
7 13	8 0
B.—Trailers only.	
—	2 14
2 14	3 3
3 3	3 12
3 12	4 0

WIDTH OF TYRES.

Exemplification tables, showing the minimum width required for the tyre of a wheel, having regard to (a) the diameter of the wheel, and (b) the axle-weight of the axle to which the wheel is attached.

Tables VII. to XI. are on the following page.

Table XII.

WHEEL DIAMETER—4 ft. 9 in.
(Unit of reg. axle weight 9½ cwt.)

Axle weight.		Tyre width.		
From	To			
A.—Heavy Motor Cars.				
tons	cwt.	tons	cwt.	inches.
—		4	12½	5
4	12½	5	1½	5½
5	1½	5	11	6
5	11	6	0½	6½
6	0½	6	9½	7
6	9½	6	18¾	7½
6	18¾	7	8	8
7	8	7	17½	8½
7	17½	8	0	9

B.—Trailers only.

—	2 15½	3
2 15½	3 4½	3½
3 4½	3 14	4
3 14	4 0	4½

Table XIII.

WHEEL DIAMETER—5 feet.
(Unit of reg. axle weight 9½ cwt.)

Axle weight.		Tyre width.
From	To	
A.—Heavy Motor Cars.		
tons cwt.	tons cwt.	inches.
—	4 15	5
4 15	5 4½	5½
5 4½	5 14	6
5 14	6 3½	6½
6 3½	6 13	7
6 13	7 2½	7½
7 2½	7 12	8
7 12	8 0	8½

B.—Trailers only.

—	2 17	3
2 17	3 6½	3½
3 6½	3 16	4
3 16	4 0	4½

Table XIV.

WHEEL DIAMETER—5 ft. 3 in.
(Unit of reg. axle weight 9½ cwt.)

Axle weight.		Tyre width.
From	To	
A.—Heavy Motor Cars.		
tons cwt.	tons cwt.	inches.
—	4 17½	5
4 17½	5 7½	5½
5 7½	5 17	6
5 17	6 6½	6½
6 6½	6 16½	7
6 16½	7 6½	7½
7 6½	7 16	8
7 16	8 0	8½

B.—Trailers only.

—	2 18½	3
2 18½	3 8½	3½
3 8½	3 18	4
3 18	4 0	4½

Table XV.

WHEEL DIAMETER—5 ft. 6 in.
(Unit of reg. axle weight 10 cwt.)

Axle weight.		Tyre width.		
From	To			
A.—Heavy Motor Cars.				
tons	cwt.	tons	cwt.	inches.
—		5	0	5
5	0	5	10	5½
5	10	6	0	6
6	0	6	10	6½
6	10	7	0	7
7	0	7	10	7½
7	10	8	0	8

B.—Trailers only.

—	3 0	3
3 0	3 10	3½
3 10	4 0	4

notice of cancellation of the existing registration should be sent by him to the Council under Article VI. of the Registration and Licensing Order, 1903. On the expiration of six months after the date of commencement of the Order the registration of any heavy

motor car which was registered before that date and with respect to which the procedure prescribed by the regulations has not been followed will cease to have effect, and the entries in respect of that car can be cancelled in the Register.

THE VIEWS OF LEADING ENGINEERS CONCERNING THE NEW "HEAVY-VEHICLE" REGULATIONS.

CONSIDERING the great importance, and far-reaching effects, of the new Local Government Board Regulations, we have invited several of the leading men in the "heavy-vehicle" section of the industry to give us their opinions concerning them. The majority of these communications, which will be found to be of very great interest and importance to many of our readers, have unfortunately arrived too late for insertion this week, owing to the comparatively short time that has been available. The following, however, have reached us in time, and we intend publishing the remainder next week:—

Views of Mr. Sydney Straker, the President of the Society of Motor Manufacturers and Traders, upon the new Regulations.—Mr. Straker regards the regulations as on the whole satisfactory, but as they are practically identical with the draft report which was sent round last summer, he finds it difficult to understand the justification for the six months' delay which has supervened between that draft and the ultimate issue of the regulations. After pointing out the leading provision of the new regulations, he continues:—

"A concession in my opinion is extended to all owners who possess motor cars exceeding a tare weight of 5 tons, but which are under 7 tons and were registered before September 1st, 1904. In these cases, the cars are to be brought before a registering authority and be permitted to be used, subject to the tyre widths being amended to schedule, and, of course, the axle-load limitation being enforced.

"The Government circular which accompanies the order contains a most useful clause. It refers to the definition of weight, and while disclaiming any intention of interfering with the ambiguous clauses so well known to us and contained in the 1896 Act, it goes on to say that the expression 'weight,' when applied to a motor car or trailer unladen, does not in itself determine what can be regarded as part of the vehicle and what can be regarded as part of the load, and it appears to the Board that whilst any essential part of the vehicle or its mechanism is clearly included in calculating the unladen weight, the circumstances of construction may in certain cases permit of a detachable framework or body being treated as part of the load rather than the car itself.

"Public service, and in fact all vehicles destined for

commercial purposes, and to which are fitted rubber or soft material tyres, are exempt from tyre width regulations, and if the axle load does not exceed 6 tons, they are permitted to travel up to 12 miles an hour.

"Users of cars weighing up to 7 tons should congratulate themselves upon being able to continue their use after complying with regulations concerning wheel widths and tyres, but subject, of course, to the maintenance of axle-load limitation, which is secured at the expense of the load carried.

"The 5-ton tare limit is, in my opinion, sufficient to enable all manufacturers who have been through the mill, and are well experienced in this special line of engineering, to produce a car that will stand up to the work and give satisfaction. This is only possible due to the developments in the manufacture of materials, and which could not have been effected some two years or eighteen months back.

"The restriction of speed is also, I think, desirable; the result will tend to considerably increase the life of cars and prevent undue vibration to roadside houses; and we must appreciate that, to obtain a successful showing, the consideration and good opinion of the public are essential.

"The gross and axle-load limitations appear to provide sufficient to enable the motor wagon to continue to perform useful work so long as the tare limit does not exceed 5 tons, but wagons already in use exceeding this weight can only be employed with from 3 to 4 ton useful loads, although, if used with trailers, they may still make a good showing, due to the extra load capable of being carried in the truck, which is now permitted of a capacity representing 8 tons gross moving weight.

"It should be noted the registered axle weight defines the speed limit, and not the actual axle weight, which appears a weak solution to the difficulty, preventing as it does taking advantage of the 8 miles speed in cases where cars are only laden to the extent of a 6-ton axle load, or less.

"The regulations are certainly favourable to the employment of tractors and trailing trucks, due to the extra truck weight permitted, but as this system of traction is more suited for short-journey work, it will not encroach upon the motor wagon which possesses the dual qualities of acting both as a carrier and tractor.

"No doubt the effect of obtaining a definite mandate from the Local Government Board will materially increase the use of heavy traction upon common roads, as, notwithstanding the doubtful advantages of employing obsolete and primitive patterns of motor wagons, there is no question that numerous firms are securing enormous pecuniary benefits by the adoption of modern machines.

"Prices may not be immediately affected, although, now cars can be laid down in quantities, the cost of manufacturing must eventually result in reduction of price, and the more universal adoption of heavy traffic.

"In conclusion, I should recommend all users to immediately secure a copy of the Act, and become familiar with its contents, and I would add testimony to the excellent work carried out by the Motor Traders' Society, the Motor Van and Wagon Users' Association, and the club, in providing witnesses for giving evidence before the Special Committee, and resorting to every method in their power to uphold the rights of users and manufacturers, and thus enable a large industry, purely of British origin, to expand and secure such license as has been found necessary by the dictates of experience."

J. Shaker

Mr. John H. Toulmin, a Director of Messrs. T. Coulthard and Co., Limited, writes:—"We think that these regulations are a very good compromise between the restrictions desired by the county councils and local authorities and the requirements of the builders of heavy motor cars. Whilst, in our opinion, fully protecting the roads, &c., in every way, and giving the local authorities every reasonable control over the vehicles, they at the same time will allow the makers to build vehicles that will carry loads that will be commercially profitable and economical, and will in many cases be very profitable. For ourselves, although in the early stages we might have desired a 6-ton tare limit, or possibly the abolition of the tare limit, still we have tried to look at the matter from all sides, including those of the public and the authorities, and now feel very satisfied with the result, especially as our interpretation of one of the provisions leads us to think that structures such as water-tanks, van or 'bus bodies, will be permitted, subject to the condition that such bodies are weighed in as part of the load rather than as part of the tare of the vehicle. Possibly our satisfaction is somewhat increased by the fact that for some months we have been making a vehicle that complies in all respects with the regulations, and at the same time carries about the largest load allowable thereunder."

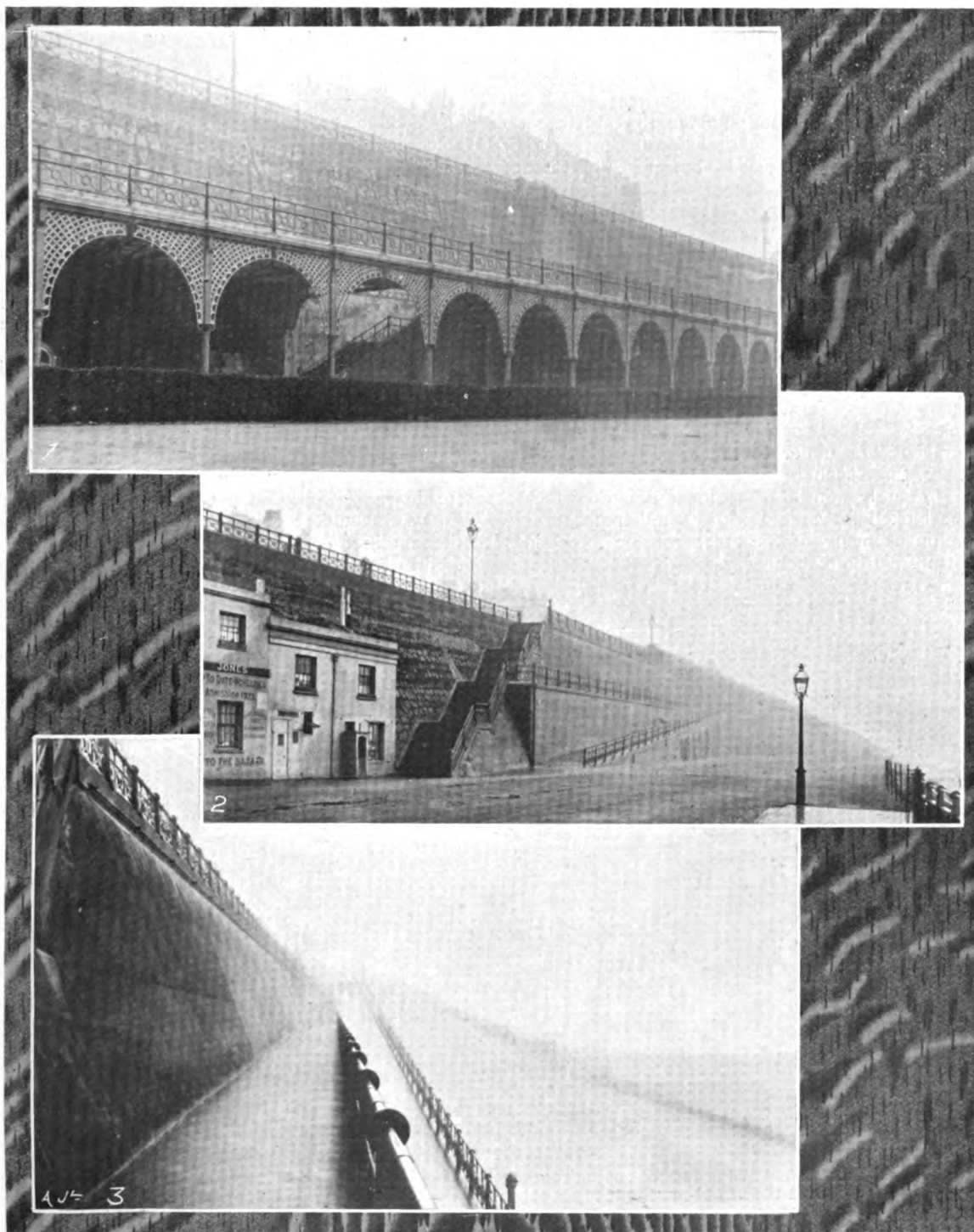
John H. Toulmin

WHAT "new skidding tyres from Paris" may be, one rather dreads to think, at any rate they are alleged to have produced some lively phenomena at Lower Marsh, Lambeth, and a subsequent appearance before a magistrate at the Westminster Police Court. At 2 o'clock on the morning of the 10th ult., a constable on duty in that classic thoroughfare, the Lower Marsh, observed a motor car coming along at a furious rate of speed, so furious, indeed, that the constable could not take the number, and as it was one and a half hours after closing time one may conclude that this effect was direct evidence of the actual velocity of the car. Some of the authorities who make a practice of maintaining our thoroughfares in a condition resembling the trenches of an army under shrapnel shell bombardment had been executing an extensive excavation which was partially covered over and surrounded by a phalanx of ten red lamps in the customary style. These the automobile charged at full tilt, and scattered to right and left, ultimately jumping the trench, bomb proof shelter, or whatever else it may have been, which was 4 ft. deep, and 4 ft. 6 in. wide, and still speeded on its way, in spite of some injury to one of its back wheels. The owner of the car, who presumably wondered what had happened to his vehicle when he observed its condition the following day, made enquiries, and the result was the appearance of the driver at the police court. He explained that it was a wet night and the car had on some "new skidding tyres from Paris," he having just finished a Continental tour. He added that the "skidding tyres" rendered it dangerous to pull up, and that in contrast to the usual phenomena observed by people going home at this hour of the morning, instead of seeing ten warning lamps he only saw one. The magistrate very naturally appears to have regarded this driver and his "skidding tyres from Paris" as a public danger, and has suspended his further dangerous activity by interning him at the public expense for two months. When the driver emerges from his compulsory retirement it is to be presumed that when he desires to practise steeplechasing on a motor car, he will select some less-frequented and well-known thoroughfare than Lower Marsh.

THE importance of a theoretical training in automobilism is being more and more recognised. Some time ago we alluded to the course which had been introduced in the Northampton Institute at Clerkenwell, and now it is pleasant to have to add that the Borough Polytechnic Institute is adopting similar lines. Its automobile course comprises a set of lectures dealing with the construction of internal combustion engines and motor vehicles, while there is also a valuable practical course, in which the students are given actual workshop instruction in grinding in valves, tuning ignition apparatus, adjusting carburettors, and all the various repairs that a mechanic has to be acquainted with to keep a modern automobile in good running order.

WATER softening, of which there are many systems, is a subject of some interest to the general engineer, so that some importance attaches to the new process of softening and sterilising by prolonged boiling, forming the subject of the Lawrence patent, for which a company has been formed. Combined with a large steam plant the softener can be utilised and rendered economical as a feed-water heater.

RACES, RECORDS, AND TRIALS.



BRIGHTON AUTOMOBILE RACE MEETING.—(1) The Terraces with convenient arches beneath for special stands. (2) A View of the end of the Course, looking from the Finishing Point. (3) The Course, as seen from one of the Terraces overlooking the entire length of the Front.

Speed Races on Brighton Front.—It has now been practically settled that during the present year important speed races will be run on the Brighton

Front. The races will take place on the east portion of Brighton Front, which stretches from the Aquarium towards Rottingdean. The finishing point will be about

300 yards east of the Aquarium, the length of the course available being about 2,200 yards, which will give ample room for a mile race and opportunity for securing fast times for the flying kilometre, whilst allowing a fair start for getting up speed, and ample margin for stopping after passing the finishing point. The 60-foot road, which reaches to the beach on one side, provides splendid points for seeing the races on the other side, as the cliff wall forms a series of terraces which will give accommodation to thousands of the public, who will at the same time be entirely protected by their position from the smallest fear of danger in the event of slight mishaps to any of the cars. An idea of the advantages in this respect may be gathered from the photographs which we reproduce, which we had unfortunately to secure on a very misty day. The Brighton authorities fully appreciate the advantages of such a meeting held annually, and will co-operate in every way to ensure successful meetings each season. With such a splendid course in the South of England, and with Blackpool course in the west, it only remains to select some equally good sea-front in the east, such as Yarmouth, to practically provide the whole of England for automobile race meetings of this character; and under the proper supervision of the A.C.G.B.I., three such big annual race fixtures should become presently almost of national importance, and would be looked forward to with as much pleasurable anticipation as many of the great horse-race meetings which at present hold such sway.

is designed to carry four passengers. The cost being a reasonable one, and within the reach of the "man of moderate means," this test of a comparatively-speaking low-powered car should prove of very great interest to an enormous number of the automobile public. The daily runs will be about 170 miles each, and, therefore, to cover the 5,000 miles) about thirty consecutive days (omitting Sundays, will be occupied in the task, each day's run being made under ordinary touring conditions, and in the same way as an owner of a car would ordinarily travel. Involuntary stops, however, whether through mechanical or tyre troubles, will, as before, be noted by the official observer, and duly registered and published, whilst the fuel and water consumption will in like manner be taken and the cost of working thereby rendered clear. The selected routes for the trial are the Oxford Road, the Coventry Road, the Great North Road, the Banbury Road, including the ascent and descent of Sun Rising Hill, the Bath Road, and the Exeter Road. In a severe trial of this character the selection of the tyres is a matter of much moment, and the decision of Mr. Siddeley, who has been for many years connected with the tyre trade, and is, therefore, thoroughly experienced in the manufacture of tyres, to employ 105 mm. "Continental" tyres of the square tread type, is worthy of note. The test at this time of the year should prove a particularly severe one, owing to the condition of the roads and the weather. The greater credit will therefore be due to the makers of the Siddeley



5,000 Miles Reliability Trial.—The 12-h.p. Siddeley Car at the Club Garage before starting. Mr. Sidney Girling is at the wheel, his companion driver, Mr. Sutcliffe, being seated beside him.

5,000 Miles Reliability Trial.—The second officially observed long distance trial, since the Automobile Club decided to vouch for tests of this character, started on Monday last at 8.10 a.m., when a 12-h.p. 2-cylinder Siddeley car left the Club Garage in Down Street, Piccadilly, on its first day's run under official supervision. This entirely British-built car, constructed for the Siddeley Autocar Company, by the Wolseley Tool and Motor Car Company, Limited, at their Crayford Works,

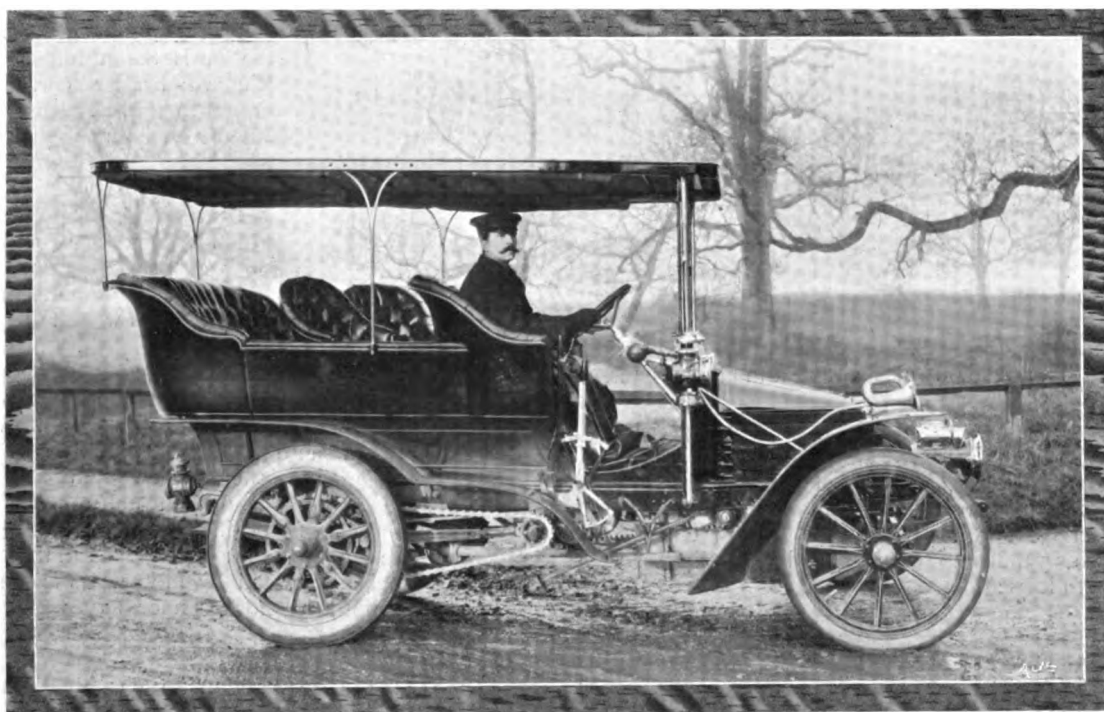
car when they have successfully accomplished their task, as we have every confidence they will. The driving has been entrusted to Mr. Sydney Girling and Mr. Sutcliffe, who will drive on alternate days, Sunday in each week being a day of rest. It will be remembered that a similar Siddeley car, but of 6-h.p. only, obtained the highest award and gold medal in the Automobile Club's Light Car Trials at Hereford last September.

THE runs for the first two days brought no troubles other than the ordinary luck of travelling provides. The official details of these two days is as follows :—Monday, January 2nd, Oxford Road—No involuntary stops; puncture of near-side driving-wheel tyre at 134 miles; distance 165 miles. Tuesday, January 3rd, Coventry Road—One involuntary stop owing to want of petrol, 159 1/2 miles; puncture of off-side driving-wheel tyre at 99 miles; distance 185 miles.

Delhi-Bombay.—On Monday last this Indian trial, which started on December 26th, at Delhi, was successfully completed, when 21 cars drove in procession through Bombay, the streets of which were densely packed with interested Europeans and astonished natives. During the whole 1,000 miles' run not a single

Cup, for the most economical machine, to a Speedwell; the Maharaja of Mysore's Cup, for the car finishing in the best condition, and the Maharaja of Kapurthala's Cup, for the car best suited to district work in India, both go to De Dion cars; and Messrs. Jeremiah Lyon and Co.'s Cup, for the car making the best performance as regards reliability, and costing not more than £500, is won by a Darracq. The *Times of India* Consolation Prize was won by a Wolseley. An extra prize, given by the Nawab of Rampur, for both absence of noise and vibration and ease in manipulation, is secured by a Fiat car.

De Dion Cup.—The Marquis De Dion, having failed to find sufficient supporters for his suggested alterations in the Gordon-Bennett Cup Rules, discussed at the recent meeting of the clubs in Paris, has now determined



Lord Hindlip is becoming a regular customer of the Wolseley Company. He has already had a 10-h.p. wagonette from them which has given him every satisfaction, and has now just been supplied with a 24-h.p. long, double tonneau car. The car is provided with tulip seats, and has, as will be seen from the photograph we reproduce above, a curved dash with a plated rail, which greatly adds to the graceful appearance of the vehicle. The principal dimensions of Lord Hindlip's new acquisition are—wheel-base 8 ft. 6 in. and track 4 ft. 3 in. The wheels are fitted with Michelin tyres 36 by 3 1/2, with Shaw non-skid treads on the back wheels.

casualty is reported, although a heavy crop of tyre troubles were experienced by many of the cars. A remarkably good record has been made, particularly by the small cars. A 6-h.p. Wolseley car, and a 12-h.p. Darracq, covered the entire distance without an unauthorised stop, and both are reported to have gained full marks. On the whole the competitors speak in the highest terms of the roads, but hotel accommodation during the run has been found very deficient. Mr. Basil Johnson's Napier car did some very fine journeys, and up to Maksi, on the fourth day, is reported to have come out with top honours. In regard to this car we are advised that it did the best average speed for the whole journey, and only had stops amounting to 1 1/4 minutes. The awards briefly advised by cable are as follows: The Gaikwar of Baroda Cup, for the most reliable car, goes to a De Dietrich car; the Maharaja Scindia of Gwalior's

to found a cup to be run for, broadly, upon the lines suggested by him for the G.B. rules. The contest will be by teams of three of the same manufacture over a distance of about 1,000 kiloms. Speed and regularity of running throughout the contest will govern the event, for which purpose proper observers will be appointed to note all repairs and incidents. It being intended to be a trial of cars and not of men, conductors may be changed *en route*, and the trophy will be competed for in the country of origin of the car team winning the trophy from year to year. The organisation has been placed in the hands of the A.C. of France, and possibly may be run this year, failing which it will take place for the first time in 1906.

Malglaive Cup.—Under this title a cup has been offered by Mons. Pierre de Malglaive, one of the leading



The well-proportioned Landaulette shown in our illustration is one of the latest that has been turned out by Messrs. J. W. Brooke and Co., of Lowestoft, who now have on order, we learn, more cars than at any one time before. This vehicle has an elongated chassis, and the gear-box is fixed well back, thus enabling a very wide side-entrance to be provided; otherwise, it does not differ from the Company's standard 15-20-h.p. 4-Cylinder Model, with which our readers are familiar.

members of the Algerian A.C. This Challenge Cup is offered to the automobilist who reaches the most extreme point south in Algeria each year. Three years' win by the same automobilist secures the cup in perpetuity. The detailed rules will be announced later.

Oldfield's Track Records.—Details of the track records made by Oldfield at Fresno, Cal., on December 13th, the leading ones of which we gave in our issue of December 17th, are now to hand. The records made were from 15 miles up to and including 50 miles, these being as follows:—

Miles.	m.	s.	Miles.	m.	s.	Miles.	m.	s.	Miles.	m.	s.
15	...	14 2½	24	...	22 41½	33	...	31 38½	42	...	40 29
16	...	15 1½	25	...	23 38½	34	...	32 37½	43	...	41 29
17	...	15 59½	26	...	24 35½	35	...	33 36½	44	...	42 29
18	...	16 57½	27	...	25 36	36	...	34 36½	45	...	43 29
19	...	17 55½	28	...	26 37½	37	...	35 35½	46	...	44 28½
20	...	18 52½	29	...	27 38½	38	...	36 34	47	...	45 29½
21	...	19 49½	30	...	28 38½	39	...	37 33	48	...	46 31½
22	...	20 47	31	...	29 38½	40	...	38 31½	49	...	47 36½
23	...	21 44	32	...	30 38½	41	...	39 30	50	...	48 39½

On December 21st Oldfield at Los Angeles further created five new records, viz., from 5 miles to 9 miles. In our last week's issue we gave the times for the 5th and 9th miles, the full series of these records being as follows:—5 miles, 4 mins. 29 secs.; 6, 5 mins. 22½ secs.; 7, 6 mins. 15½ secs.; 8, 7 mins. 9½ secs.; 9, 8 mins. 4 secs.

A NEW road about 7½ kiloms. in length, practically flat and dead straight it is stated, has been located in Germany in the Forstenried Park about 12 kiloms. south of Munich, towards Starnberg. It is proposed to arrange to use this road for the purpose of record speed meetings.

Ladies' Automobile Club.—On February 7th an illustrated lecture "Motor Mountaineering in the Alps," will be given by Capt. Deasy in the Club rooms. On July 1st the members of the Club will hold a motor gymkhana at Ranelagh.

MOTOR BOATING.

Monaco Motor Boat Meeting.

—When the entries closed on Saturday last, 103 craft had been entered to take part in the racing. These comprised 39 racers, 51 cruisers, 3 yachts, 6 ships' launches, and 4 fishing boats.

RUMOURS are abroad that after all the Calais to London Motor Boat Race will be abandoned, and a race from Calais to Ostend substituted.



THE owner of the *gros lot* of the Paris Salon lottery, viz., the Richard-Brasier car, has been found in Mdlle. Rosset, of 25, Rue de Nemours.

DURING the gale last week, which spread over the entire country, damage is reported in connection with one of the new shops in course of erection at the Wolseley Tool and Motor Car Company's works.

MOTORISTS would do well to be on the look-out for unexpected dogs during the next two months. When dog licences become due, the less humane dog owners who desire to get rid of their former friends for the sake of saving the wretched 7s. 6d., not unfrequently compass their destruction. Drowning has, of course, been the time-honoured method, but we understand that exposure on roads much frequented by motor cars is coming into favour. Caution, therefore, is necessary.

WE have the satisfaction to chronicle one more successful appeal to Quarter Sessions by Mr. Louis Sinclair, M.P., whose conviction on the usual charge on appeal was quashed by the Recorder of Folkestone on Monday last. The evidence as regards speed had been as usual very conflicting, and the Recorder very sensibly said, in giving his judgment, that he did not think the Legislature intended that this clause should be *harshly* interpreted against the holders of licences to drive.

As an appropriate finish to the old year, Messrs. A. J. Wilson and Co., Limited, organised a very pleasant little function at their offices in Clerkenwell Road, a series of excellent recitations and songs helping to keep all the visitors in good temper until the time arrived for greeting the new year's advent. A quaint programme was drawn up by one of the members of the staff, in which automobile phrases were cleverly utilised for "pointing" several of the items on the programme. The lantern lectures, illustrating "The British Working Man" and "Events at Home and in Ireland," by Mr. A. J. Wilson, were amongst the most agreeable items on the programme.

SOME time ago it will be remembered the automobilists who had registered with the Dorset County Council objected to the letters "B.F.," which had been assigned to that county for registration purposes. The Council petitioned the Local Government Board to change the registration letters to some others, which should be less open to ribald comment. The Local Government Board has graciously acceded to this appeal, and any Dorsetshire motorist may now select either the old letters or F.X. as he so desires.

It is sad to have to chronicle almost contemporaneously with the fall of Port Arthur that the automobile, on the acquisition of which we some time ago complimented and felicitated General Kuropatkin, has broken down. Apparently there is no mechanician at present with the Russian forces sufficiently intelligent, according to Prince Henri de Bourbon from whom this report originates, to put it in proper running order again; and Russia has, therefore, not only lost the greatest fortress in the East, but her Commander-in-Chief's principal means of locomotion as well.

THE splendid De Dietrich Pullman car which was on exhibition at the Paris Salon, and a photograph of which we gave in a recent issue, has, we learn, been sold for the bagatelle of £2,000. In all probability an opportunity will be afforded of seeing this identical car at the Olympia Exhibition next month, or, failing that, its duplicate, when, no doubt, the luxuriousness of the fittings and entire construction will be appreciated by the visitors. The fortunate owner of this splendid vehicle is starting on a long tour later in the year, and will use it as a hotel, sleeping in it and carrying a servant to cook his meals, etc., the car being fully equipped with cooking stoves and utensils.

THE municipal steam motor wagons which have been used for some time past by the Corporation of the City of London, have given great satisfaction. The cost of repairs, it is pleasing to find, has been up to the present quite inconsiderable. So satisfied are the Corporation with the performance of the vehicles, that they have ordered two more steam wagons at a cost of £750 each. These wagons are so made that they can be used either as water or dust-carts. It is estimated that each one of them performs the work of six horses daily. It is mainly for collecting street dust and refuse that the wagons are employed, as they have a great carrying capacity and effect a considerable saving both in time and labour.

An automobile exhibition is proposed to take place in March at Marseilles, under the auspices of the A.C. of Marseilles.

MR. GLIDDEN'S Napier, with which he is touring round the world, will in future probably be known by a new name. We mentioned some time back that he had started for New Zealand. He has now arrived at the Island of Fiji, where he has been showing off the capabilities of the vehicle to an astonished band of natives. They are evidently duly impressed with the Napier, and have christened it "the father of all devils."

THE *Yachting World* has this year exceeded all its previous efforts in respect to their charming winter and Mediterranean number. A variety of full page reproductions, in sepia and other tints, of some delightful yachting subjects, help to form a pleasing addition to the contents, consisting of some excellently written sketches of cruise; and subjects particularly to the taste of those who spend a considerable amount of their time yachting. Close upon 60 pages of matter are provided in this issue. Among the contributions, all of which are of exceeding interest to yachtsmen, are "Turbine Propulsion," by W. Owen Wilkins; "Forty Miles through Inland Seas," by P. F. Westerman; "A Little Game that Paid," by Robert Macintyre; "The Viking and Anti-Viking Spirit of Yachting," by T. Dykes; and "Out with the North Sea Pilots," by F. C. Tansley.



When the permanent way inspector on any of our railways wishes to make a tour to see that the line is in good condition, he generally takes a small special train, consisting of an engine with a single carriage, or sometimes of an engine and carriage combined in one. But Mr. Wm. Letts, of Charles Jarrott and Letts, Limited, could tell him a much pleasanter way of performing these duties. When over in America with the President of the Company, he had an opportunity of trying the Oldsmobile railway trolley, specially designed for this purpose, and ran 150 miles on it at a speed of 40 miles an hour. The experience, he says, was delightful, while, when passing an express train, the excitement is quite thrilling. The photograph which we reproduce above gives a view of this trolley, which is provided with a 9-h.p. engine. Messrs. Jarrott and Letts are introducing this machine, for railway use, in this country.

COMMERCIAL POINTS.

The Castle Ignition-Plug for Motor Cars.—The popularity of the small "Castle" ignition-plug has led the United Motor Industries to bring out a larger size suitable for motor cars. This larger plug follows the lines of the smaller model, described and illustrated by us in our issue of September 24th, 1904, but it has a very long porcelain in order to reduce the chance of surface leakage.

THE 12-16-h.p. Clement, entered for the Delhi-Bombay trials by Mr. Arthur Hoare, was supplied by Mr. E. H. Lancaster, of 3, Leicester Street, Leicester Square, W.C., through Messrs. J. Birch and Co.

MESSRS. J. LIVERSIDGE AND SON, LIMITED, of 196, Old Street, E.C., inform us that they have appointed Mr. A. Casson their representative for the sale of the De Nevers Patent Grooved Solid Tyres. For the convenience of West-end customers, sample tyres can be seen at his offices, 44, Haymarket, S.W.

MR. H. GUTTERIDGE, who for many years has been manager of Messrs. Gamage's motor department, has opened spacious premises in Cambridge Circus, Charing Cross Road, trading as H. Gutteridge, Limited. In addition to a large stock of motor accessories, including clothing, the firm are stocking an up-to-date car at a popular price, and possess every modern convenience for motor and tyre repairs.

WE understand that Messrs. Horner and Sons, of Mitre Square, Aldgate, have obtained the sole agency for the Diamond tyres, and are placing the same upon the English market in American and millimetre sizes, together with single tube and butted tubes for same. A new departure for Messrs. Horner and Sons is a motor boat, which they are listing at 38 guineas, and a two-cylinder car with M.-O. valves, of 12-h.p. and tonneau body, for 235 guineas.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

Direct Motor Company (Limited).—Capital, £5,000 in £1 shares.

Motor Cartage and Transport Company (Limited), 30, Ben Jonson Road, Stepney High Street, E.—Capital, £20,000 in £1 shares. Object, to acquire the businesses of the Motor Transport Company, carried on at 26, Bedford Hotel Chambers, Covent Garden, W.C., and elsewhere, and of the Motor Cartage Company, carried on at 4, Tavistock Street, Covent Garden, of general carriers, etc. First directors: G. Munro, jun. (chairman), W. Deighton, and E. G. Pamplin.

Woolwich, Blackheath, Eltham and District Motor Company (Limited).—Registered office: 10, New Road, Woolwich. Capital, £20,000 in £1 shares. First directors: J. J. Messent, W. Busbridge, F. Hoar, E. Furlong, and G. R. Habershon.

PUBLIC COMPANIES WHICH HAVE GONE INTO LIQUIDATION DURING 1904:—

Voluntarily:—

- Feb. 9.—Motor Van Syndicate.
- Aug. 11.—Pioneer Electric Company.
- Sept. 2.—British and Foreign Motor Car Company.
- Oct. 10.—Traction Development Company.
- Oct. 12.—Martin Pneumatic Tyre Company.
- Oct. 20.—Locomobile Company of Great Britain.
- Nov. 7.—London General Automobile Company.
- Nov. 9.—International Motor Car Company.
- Dec. 8.—Bat Motor Manufacturing Company.

By Order of the Court:—

- Mar. 15.—Evert Hall, Limited.
- July 19.—Shippey Brothers.
- Aug. 9.—Pioneer Motor Car Company for India.
- Oct. 25.—Motor Manufacturing Company.

Bayliss, Thomas and Company (Limited).—This old-established bicycle firm, at an extraordinary meeting held last week, determined to go into voluntary liquidation, Mr. H. E. Bishop, of Birmingham, secretary of the company, being appointed liquidator. The immediate reason for this, the chairman explained, was that the business could not be carried on without incurring fresh responsibilities—£10,000 being required to pull the business round—and a receiver had been put into possession.

From approximate figures given by the auditor of the company it appeared that the estimated loss on the year's trading was £6,635, which, with other charges, made the total deficiency £13,053, to which the deficiency from last year had to be added, making a total altogether of £15,000, against total assets of £40,000.

Mr. E. Mushing said it seemed to him a great pity that a company with assets of over £40,000, and total liabilities, apart from the share capital, of under £15,000, should go to the wall. This was one of the oldest firms in the trade, with one of the most honoured names, and it seemed a pity that the new management "should have gone nap" on motor bicycles, and thrown to the wind the great connection the firm had worthily held for ordinary cycles.

The chairman said that up to about twelve months ago the motor branch was the most profitable part of the business, but in the last year there had been such insane competition in the reduction of prices of motor cycles that it had brought this down to almost as unprofitable a business as the other. He expressed the opinion that the only way the cycle trade would be put into any sensible form was by a meeting of shareholders of all the companies, and a suggestion made to the directors that they should revise prices and not sell any machines unless they could earn a profit. There was no justification whatever for this cutting of prices; it was a course that was wholly unwarranted.

Motor Manufacturing Company (Limited), in Liquidation.—Under the compulsory winding-up order made last October against this company, Mr. H. M. Winearls (Assistant-Receiver) has now issued his report to the creditors and shareholders. The statement of affairs shows total liabilities £41,125, and assets valued at sufficient to yield a surplus of £20,775, after payment of the debts. The account with the contributories discloses a deficiency of £42,453. Mr. Winearls reports that the company was formed in June, 1902, to acquire and carry on the business which had successively been carried on by the Great Horseless Carriage Company, Limited, registered in May, 1896; Motor Manufacturing Company, Limited, registered January, 1898; and a company of the same name registered March, 1900. The capital of £80,000 was divided into 320,000 shares of 5s. each. The consideration for the sale was the undertaking by the new company to satisfy the liabilities of the old company, amounting to £38,000, and to pay the costs of liquidation of the old company, and of forming the new company, and to issue to the liquidator of the old company or his nominee 252,966 shares of 5s. each, with 3s. credited as paid. Only 136,562 of those shares were applied for; but the remaining 116,404 were taken up in consideration of a payment of £2,500 by the liquidator of the old company. During the first year the business was successful, and several prizes were gained by the company's cars. A dividend of 5 per cent. was paid out of the first year's profits; but during the following year the company was in need of working capital, and issued debentures, with the result that in June last Mr. Frank E. Beadle was appointed receiver and manager on behalf of the debenture-holders. The failure of the company is attributed to want of working capital and pressure of creditors.

NEW INVENTIONS.

Patent Specifications Published.

Applied for in 1903.

Published December 22nd, 1904.

- 26,029. E. R. CALTHROP AND E. G. BREWER. Motor-driven road vehicles.
- 26,176. J. E. AND I. THORNYCROFT. Oil engines.
- 26,373. J. FILTZ. Valve mechanism.
- 26,566. C. MERRINGTON. Motor cycles.
- 26,654. F. LYST. Gas, oil, and other explosion engines.
- 27,916. G. J. EASON. Construction of valve for exhaust pipes.
- 28,285. A. H. THORNTON and others. Motor cars.

Applied for in 1904.

Published December 22nd, 1904.

- 125. G. M. ZINGEL AND A. LEHMANN. Rotary internal combustion engine.
- 389. F. STRICKLAND. Internal combustion engines.
- 684. W. AND H. SHILEY. Controlling and governing.
- 2,017. T. D. KELLY. Gas and oil engines.
- 2,057. J. T. RATCLIFFE and others. Driving belt for motor cycles.
- 2,234. W. J. CROSSLEY. Barring gear.
- 2,281. W. S. KIRKE. Internal combustion engines.
- 2,339. EMILY COUCHMAN. Friction gear.
- 2,595. J. H. RICE. Internal combustion engines.
- 3,829. F. CAM. Self-starters.
- 4,283. F. REICHENBACH. Safety devices for starting.
- 4,684. J. ANDERSON. Lamp.
- 12,805. L. RENAULT. Means for deadening shocks in mechanism.
- 21,202. M. FISCHER. Steering-gear.
- 33,233. G. DESCLÉE. Protective device for pneumatic tyres.
- 23,239. L. LAZERGES. Frames.
- 23,349. MARQUIS A. DE DION AND G. BOUTON. Apparatus for carburettor-gas alcohol.
- 23,350. MARQUIS A. DE DION AND G. BOUTON. Built-up crank-shafts.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

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Speed races on suitable sand stretches of the seashore are gaining popularity in several directions throughout the world. The first course of this character was the splendid Ormond-Daytona Beach in Florida. Probably this particular spot is unique in its perfect suitability for such races, owing not only to the great length of hard sand available but also to the width of the part of the beach which can be profitably used. An idea of its extent in this respect may be judged by the above photograph in which 22 automobiles are seen abreast ready to start on a run.

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NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C., by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
Jan. 17 ...	Lesson V.—On the Internal Combustion Engine (Ladies' A.C.).
Jan. 19 ...	*The Paris Salon, by Mr. Cozens Hardy.
Jan. 21-28 ...	Birmingham Motor Car Show (Bingley Hall).
Jan. 24 ...	Lesson VI.—On the Internal Combustion Engine (Ladies' A.C.).
Jan. 26 ...	*Problems of Traffic, by Mr. J. Swinburne.
Jan. 27-Feb. 4	Crystal Palace Automobile Show.
Feb. 7 ...	Motor Mountaineering in the Alps. Illustrated lecture by Capt. Deasy (Ladies' A.C.).
Feb. 10-18 ...	Society of Motor Manufacturers' and Traders' Exhibition at Olympia.
Feb. 15 ...	A.C.G.B.I. Annual Dinner (Hotel Cecil).
Feb. 24-Mar. 4	Edinburgh Motor and Cycle Show.
Feb. 24 ...	Manchester Motor Show.
Mar. 3-11 ...	Liverpool Motor Cycle Show.
Mar. 18-25 ...	Cordingley's Exhibition (Agricultural Hall).
Apl. 1 ...	*Light Van Trials.
Apl. 3-8 ...	Auto Cycle Club Light-weight Motor Bicycles Trial (1,000 Miles).
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 19 ...	*Brighton Speed Races.

Foreign Events (Trials, Races, &c.).

1905.	
Jan. ...	Transmission Gear Trials (Paris).
Jan. 14-21 ...	New York Exhibition.
Jan. 14-24 ...	Fourth Brussels Salon.
Jan. 21-Feb. 6	Turin Automobile Exhibition.
Jan. 23-28 ...	Ormonde Beach (Cal.) Meeting.
Feb. ...	Versailles Endurance Trial (Seine-et-Oise A.C.).
Feb. 4-11 ...	Chicago Exhibition.
Feb. 4-12 ...	Stockholm Meeting and Ice Racing.
Feb. 4-19 ...	Berlin Automobile Exhibition.
Feb. 11-25 ...	Cannes Automobile Fortnight.
Feb. 13-16 ...	Detroit Exhibition.
Feb. 15 ...	Turin Automobile Salon.
Feb. 18-25 ...	Versailles Reliability Trials (A.C. Seine et Oise).
Mar. 13-18 ...	Boston Exhibition.
Mar. 15-Apl. 9	Copenhagen Exhibition.

* Automobile Club of Great Britain and Ireland Events and Papers.

Mar. 16-29 ...	Vienna Exhibition.
Mar. 27-Apl. 5	Washington Exhibition.
Apl. 2-16 ...	Monaco Motor Boat Fortnight.
Apl. 20-21 ...	Cannes Motor Boat Meeting.
Apl. 14-23 ...	Nice Automobile Week.
May ...	Paris Industrial Vehicles Trials (A.C. France).
May 11-25 ...	Stockholm Automobile Exhibition.
May 14 ...	International Motor Cycle Cup.
June 26 ...	Mont Cenis Hill Climb.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Calais-London (Motor Boats).
Aug. 6-9 ...	Paris-Trouville (Motor Boats).
Aug. 10 ...	Gaston Menier Cup (Motor Boats).
Aug. 11 ...	Anthony Drexel Cup (Motor Boats).
Aug. 12 ...	International Cup for Motor Boats.
Aug. ...	Herkomer and Bleichroder Races.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Vincenzo-Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.
Sept. 3-10 ...	Royan Meeting.
Sept. 3-10 ...	Spa Automobile Club.
Sept. 11 ...	British International Cup for Motor Boats (Arcachon).

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PASSING EVENTS.

French and English Automobile Industries.

THERE is one subject which can never be too much impressed upon the British manufacturer, the British automobilist, the British member of Parliament, and the British elector, and that is what the fostering of the automobile industry during recent years has meant for the prosperity of the French Republic. We have just obtained the figures published by the Customs authorities both in France and this country. We give them in a table on another page, and supplement the table by a curve showing the rapid increase and growth in French manufactures and exports. The rapidity of this increase since 1900 is nothing less than phenomenal. We quote a few of the figures so as to enable a general view of the situation to be readily obtained. In 1898 England was

the chief customer for French automobiles. That is, of course, natural enough, for, in that year, British manufacturers had hardly commenced to build automobiles on anything like a large scale. Even so, France then only exported to Great Britain automobiles and parts to the value of £22,800, though this was nevertheless 31 per cent. of their total exports. In the five years that have elapsed since then, the growth of exports to this country from France has been remarkable. England now takes 62 per cent. of all the motor cars that France sends abroad, and the value of those exports to this country in 1904 was 45,000,000 francs (£1,800,000). It is small wonder that the French are anxious to preserve the "entente cordiale." The value of Great Britain as a customer has, it will be seen, grown by leaps and bounds, and this is not a trade that is to be put on a level with the exports of raw materials and foodstuffs, which we have always drawn in large quantities from the Republic. On raw materials the profit is small. On finished products, like automobiles and engines, the profits are enormous. The value of the raw materials that are worked up into a finished motor car is insignificant. In buying automobiles to the tune of nearly two millions yearly, we are paying practically the whole of that amount for French brains and French ingenuity, for it is largely with our own raw materials that these vehicles are constructed, international payments being effected by exchange of goods and never of specie. And this result comes from three things. The imbecility of our legislature, which for so long restrained, by preposterous enactments, the growth of the new industry, the inertia and prejudice of the bulk of the population, and the baleful operations of the company promoters in the first years after 1896. Here we encounter a yearly expenditure of nearly two million pounds, and the greater portion of this amount, British manufacturers, under more favourable circumstances, might have divided among themselves. They now build just as good cars as their French rivals, they build them just as quickly, and above all, it is an advantage to a car owner to have a car built in the country in which he lives, as he can generally obtain duplicates and spare parts more quickly. And yet all the above-mentioned enormous profit goes abroad, and even the revenue of the country does not benefit a single penny. Things are improving, no doubt, but the figures are a lesson to British capitalists to support home industries. English manufacturers have shown, over and over again, that they can turn out as good work as any of their Continental rivals. If British capitalists would only confidently back them up, the greater part of this enormous annual expenditure might remain in this country, and deflect British labour into a more highly paid sphere, so that instead of causing the export of our national wealth—minerals, for example, which cannot be replaced—British workmen might be to a greater extent paid by the raw materials of other countries.

The Rating of Motor Boats.

NEARLY every day that passes witnesses an increase in the interest taken in motor boating as a pastime, and in motor boat racing as a sport. Hitherto petrol boats have mainly had the field to themselves. Indeed, the system of rating adopted has not provided for the admission of steam-propelled boats. This state of affairs is not as it should be. The Automobile Club has accordingly wisely decided to elaborate a set of rules by which this much-desired result can be attained. The

problem is not one which can be solved in a hurry; it will have to be very carefully considered. But one thing is quite certain, the present system of rating will not do for steam boats, since it involves a measurement of engine power which is not altogether satisfactory even for petrol boats, and is altogether inapplicable for steam boats. The principle of rating adopted, as most of our readers know, is to take the ordinary rating of a boat as a hull, and multiply it by the so-called motor power, or a function of it. We explain on another page what "motor power" is, but it will be seen at a glance that as at present estimated—by volumetric measurement—it would not apply to boats propelled by steam engines in any competition in which they might engage. What is wanted, therefore, is some comparatively simple means of measuring the actual performance of any particular motor, whether steam or petrol, which will enable the power which they develop to be comparatively estimated. After much consideration, we have come to the conclusion that fuel consumption would provide a very good basis for such a comparison, and in a special article on the subject, which appears on another page, we discuss the considerations which the problem involves. The subject is one of special interest to all concerned in the organisation of motor boat races and reliability trials, and should at the same time appeal to all who have adopted motor boating as a pastime, or intend to do so, since a ready means of ascertaining what the approximate power of a motor boat engine is, is of value to any owner or intending purchaser.

Dangerous Obstructions.

No road carries more traffic out of London than the Great North Road. It takes a large proportion of all the traffic that runs north, being as it is one of the main trunk thoroughfares, while practically the whole of the through traffic to the part of the country lying between London, St. Albans, and the Birmingham Road on the one side, and the Baldock and Cambridge Road on the other, pass along it. Usually it is one of the most crowded roads out of town. Many motorists have spent much time, thought, and ingenuity in devising methods by which they can escape north from the Metropolis without having to negotiate it. They will be spending more time and ingenuity still unless the very justifiable representations which the Roads Improvement Association have been making to the Local Government Board on the subject of some recent æsthetic additions to the road result in action by that Department. What is termed legally a light railway, that is to say of course an electric tram, has obtained powers to run along the North Road for some five miles out, starting from the London County Boundary in Archway Road. The tramway is also to be permitted to erect central standards along the middle of the road for carrying the overhead conductors, forming that additional æsthetic adornment of our not always beautiful streets, on which we have so frequently enlarged. This portion of the North Road has always been crowded with traffic as already pointed out. Its surface is usually execrable, and it is a magnificent stretch of roadway in moist weather for encouraging side-slip. Authorities who have considered the subject with some care have come to the conclusion that the erection of these central standards diminishes the width of the road for all practical purpose by at least one-third. In addition they are exceedingly dangerous on roads where side-slip is a possible contingency, and in addition to the bad surface of the North

Road at this point, the probabilities of side-slip are greatly increased by the presence of the tram lines. The proposed standards, therefore, will be nothing less than a nuisance and danger to all the traffic passing along the road, and will be a very special danger and nuisance to automobilists. The Local Government Board, it will be remembered, on a recent occasion undertook, at the instance of the Roads Improvement Association, not only in future to use their influence to discourage the use of centre standards, but even never to agree to their erection unless in very exceptional circumstances. It is true that the consent for these particular standards was given before the Board had arrived at this decision, but the arguments against them, both in general and in this particular instance, are so overwhelming that we trust that the present representations of the Roads Improvement Association may be followed by the withdrawal of the sanction for these unsightly and dangerous erections.

Almost at the very moment that the subject was brought before the Local Government Board by the Association, a painful object lesson has been provided on the dangers which these central standards cause, by the accident which happened to Mr. Chirgwin, the well known music hall artist. On Sunday last he was running down to Nottingham, with his wife and daughter, when his car skidded on passing through Leicester, and collided with one of the iron standards carrying the overhead tramway wires of that town. It was a serious accident, the car being badly damaged, and though Mr. Chirgwin and his daughter fortunately escaped injury, Mrs. Chirgwin sustained a badly sprained ankle. There are few more popular figures on the music hall stage than Mr. Chirgwin, and had the accident proved fatal to him, as it very well might, the regret it would have occasioned would have been profound and general. The accident, we think, can hardly fail to enforce the argument against the proposed erection of the central standards on the North Road which have been so forcibly put before the L.G.B. by the Roads Improvement Association.

Proposed Legislation by the Association.

CERTAINLY the energy and initiative which the Roads Improvement Association is displaying in several directions at once are deserving of the highest commendation. Almost at the same moment that we learned of their public-spirited action in memorialising the Board of Trade on the public nuisance of the tramway standards on the Great North Road, we hear that they have under consideration the draft of a Bill which it is proposed to introduce into Parliament next Session. The Bill in question aims at embodying the chief recommendations made by the Departmental Committee on Highways, which concluded its sitting some time back, and before which valuable evidence was tendered by Mr. Rees Jeffreys, the secretary of the Association. It will provide for (1) the creation of a central department for the purpose of assisting—we trust also controlling—the local highway authorities; (2) a large increase in the highway powers of county authorities; (3) the construction of new main roads through and out of large urban districts; and (4) the protection of the interests of ratepayers by providing that suburban districts shall be laid out according to some plan providing for new trunk roads before building operations commence—a provision which should obviate the necessity of subsequent expensive road widening operations.

Needless to say, we hope the proposed Bill may meet with the fullest measure of success. Above all, we trust that it will provide the central controlling authority, which it designs to create, with adequate powers of supervision over the local authorities. The existence of a central body with adequate powers should have the effect of rendering impossible such a scandal as the manner in which the motor 'bus service of the Great Western Railway in Cornwall has been checkmated, and the similar attempts, which are being made to play the same contemptible game in the Isle of Wight. The effectiveness of the other provisions mainly depend upon the amount of money which may be available for the purposes contemplated in the future. At present no adequate powers exist for improving our road means of communication, and it must be remembered that in general we are trying to get along with a system of roads which has remained practically unaltered since the early days of the nineteenth century. When the powers exist, funds may or may not be forthcoming, but if the inhabitants of this country understand their true interests, these funds will be provided, and provided liberally.

Appeals to Quarter Sessions.

It is always pleasing to be able to chronicle successful appeals by motorists from the adverse decisions of Petty Sessional Magistrates. There have been a good many of these during the past year, and it must be admitted on the whole that Quarter Sessions have in general taken a much more enlightened view of the cases brought before them than the magistrates in the first instance have usually done. We were, when the Act was in making, not very sanguine as to what the results of appeal to Quarter Sessions would be, and we joined, it will be remembered, with those who advocated that in such cases appeal should lie directly to the Divisional Courts. But Quarter Sessions have proved themselves to be much less prejudiced than we had anticipated. The explanation of the phenomenon, considering that Quarter Sessions Benches are usually composed of magistrates of exactly the same type as sit at the Petty Sessions, is not very easy to find. Possibly the fact that Quarter Sessions are in some cases presided over by a Recorder—a gentleman with regular legal training—may to some extent explain the difference between the two classes of court.

The first of the successful appeals to which we refer was that brought by Mr. Charles Gabriel, who, as our readers will remember, was convicted by Mr. Kennedy, sitting on the 2nd of August last, on the usual charge. Mr. Gabriel had fallen into the police trap which has for a long time been established in the neighbourhood of Holland House, and, though the evidence was of the flimsiest description, he was convicted by Mr. Kennedy, sitting, by an untoward accident, at the West London Police Court, and fined £5 and costs. The appeal was heard at the Clerkenwell Court under the presidency of Mr. Loveland Loveland, K.C. Mr. Grain appeared for the Commissioner of Police, and Mr. Horace Ivory, K.C., and Mr. Moresby White for the appellant. After the case and evidence for the prosecution was produced, only three witnesses for the defence were called, when the Court stopped the further hearing of the case, declaring that no further evidence for the defence was required, and quashed the conviction, a notable feature of the action being that, for the first time in the Metropolitan area, costs were allowed against the police in an appeal from a magistrate's finding. As this

will run the police into something like £100, it will, we trust, make them more cautious in future. We also hope it will have a similarly beneficial effect upon Mr. Kennedy, who, as we have pointed out from time to time, has on several occasions given proof of his violent animus and antipathy to automobilists and the motor car movement generally. He has now had a good rap over the knuckles, as it is not a distinction much appreciated by a magistrate to have his convictions upset in this way, and Mr. Kennedy enjoys the further distinction of being the first magistrate in the Metropolis whose neglect of the elementary rules of fairness and the principles of evidence has had the effect of causing the police to be mulcted in a serious amount for costs.

The other successful appeal to which we refer was the case of Colonel Kemp, who, as our readers will remember, very much against the evidence, was in November last convicted by the Bolton Borough Bench for driving along the Chorley Old Road in that borough "at a speed dangerous to the public," &c. The appeal, which on Friday came before the Recorder for Rochdale at the Bolton Quarter Sessions, was characterised by the most exemplary fairness; experiments with the car, the rate at which it could proceed, and above all, the ease with which it could be stopped, having with a special view to the appeal been carried out in the presence and with the assistance of the Chief Constable of Rochdale. These experiments proved that the motor car, when going at its fastest pace even on a down grade, could be

stopped in 22 paces, and the Recorder, after hearing the case, decided to quash the conviction, though at the prompting of the Clerk, who said it was against custom to give them, he refused costs against the police. A rather remarkable feature of this case was the evidence of Detective Taylor, who was the principal witness for the prosecution. He made a great fuss about a child being endangered, and after declaring that the child in question only escaped by the skin of its teeth, admitted that he took no further interest in what happened to it, "as he did not think that the case would develop as it had done"—a statement which appeared to produce a very marked impression upon the mind of the Recorder.

Both Mr. Gabriel and Colonel Kemp are to be congratulated on the successful result of their appeals, and they should also, we think, be thanked, in the names of all the motorists in the United Kingdom, for the tenacious way in which they have maintained their rights. The manner in which wealthy automobilists have shown themselves willing to fight such cases, and incur the often serious expenses of appeal, is really very public-spirited on their part, and it is distinctly beneficial to poorer motorists, many of whom could hardly afford to adopt a similar course. The success of appeals to Quarter Sessions has undoubtedly had the effect of making magistrates more careful, and policemen less anxious to organise the class of trap and to provide the type of evidence which has done so much to bring the Police Force into discredit.



MOTOR BOAT RATING—A PROPOSED "M.P." REFORM.

Now that it is proposed by the Automobile Club to draw up rules by which boats propelled by steam power can compete with petrol launches in motor boat events, it is a particularly appropriate time to discuss the whole question of the power rating of marine motors, the present practice in regard to which has never appeared to us to be thoroughly satisfactory. It might, perhaps, be as well, in the first place, to recall that the rating of motor boats essentially depends upon two entirely different factors, these being the dimensions of the hull on the one hand, and the power of the engine on the other hand. We are not, however, concerning ourselves in any way at the moment with the question of hull rating—though much has yet to be said and decided concerning it—but it has hitherto been the custom of the Marine Motor Association, at least, to determine the power of the engine by a system of measurement that is far from convincing. Not only is the Marine Motor Association formula for "motor power" (M.P.) both arbitrary, and the figures obtained by its use nothing more than "nominal," but that formula is totally unsuited as it stands for application to steam engines, and cannot—so far as we can see—be satisfactorily modified to render it so. The M.P. of an engine, being derived from the bore, stroke, number of cylinders, and number of revs. per min., multiplied together, is in reality purely a measurement of possible consumption of explosive mixture per min., and further depends entirely for its accuracy on the correct assumption of engine speed.

Inasmuch as it is a measure of possible consumption, it does roughly determine the probable power of the engine at that speed, but there is no guarantee—either before or even after an event—that the declared speed was even approximately adhered to during the actual race.

Ideal v. Possible Methods.

Of course, the most satisfactory way of determining the power would be either to ascertain the engine speed by actual trial in the water, and then to take a brake test of the engine on land at that speed, or to test the power with a transmission-dynamometer under racing conditions in the boat. But, obviously, no such tests as these are practicable. Even if the present M.P. formula were satisfactory enough for petrol engines—and it is probable that the variations from accuracy of comparison do not amount to more than say 25 per cent.—yet it will be seen to be almost hopeless for steam engines, since there are the additional unknown factors of steam pressure, and of variable "cut-off" as well as that of engine speed. Possibly it might be feasible to devise means for checking the steam pressure—when an official "observer" formed part of the crew, and it might be assumed that the latest "cut-off" available were made use of during the entire event. But even then any calculated figures would probably be too inaccurate to be satisfactory, and a good deal of tedious labour would, at any rate, be imposed upon the officials at a race, or other event. Further than this, it must be borne in mind that the admission of steam-propelled craft to these events is almost sure at an early date to lead to the entry of boats fitted with flash-steam boilers and those propelled by turbines, for neither of which is the present M.P. formula, however modified, at all suitable.

To conclude the "destructive," before commencing the "constructive" portion of our argument on this subject, attention may be drawn to the fact that already it has been found necessary, in the present M.P. formula, to include alternative constants for "four-stroke" and for "two-stroke" petrol engines, and that considera-

tion has even been devoted to the adoption of other constants for engines using different kinds of fuels. Apparently, therefore, the use of constants is an unavoidable evil, and, do what we will, assumed data of some kind is needed for approximating the power of engines that work on different systems.

Our Suggested Method.

In order to overcome the difficulties of satisfactorily modifying the present M.P. formula so that it can be applied to any type of power generator, and so that it may further act as a more ready check on declared data, we propose to consider a possible solution that naturally suggests itself from the recent "Tourist Trophy" rules for cars. By basing the M.P. of an engine—and the test may be applied to any kind of engine—on its fuel consumption per hour, we still employ a measurement of consumption (as at present), but, instead of its being merely a measure of *possible mixture* consumption, it is an *actual* measure of the amount of the available energy that has been supplied to the engine. The only check required is easy to make, and is moreover invaluable, as it can be made by anyone—manufacturer, purchaser, or race official—at any time, and because a quantity of useful scientific data would be placed on record by its employment. It is true that, of two engines acting on the same principle, one may have a lower fuel consumption per h.p. hour than the other, but it is unlikely that there would ever be more than about 10 per cent. difference in this respect between those of up-to-date design. It would, moreover, tend to induce manufacturers to devote more attention than they now do to efficiency, as against mere output in relationship to weight,—in itself an excellent result. On the face of it, therefore, it seems as though a strong case can be made out for this suggestion, since even as between petrol engines, it is probable that a more accurate rating of power—10 per cent. error as against 25 per cent.—would result, and since there would be an absolute check upon at least any flagrant mis-statement of declared power.

Some Subsidiary Advantages.

But this is by no means all that can be said for it. For one thing, a premium is put on the "best" engine, since the "best" engine is that which has the lowest fuel consumption and the highest output—the lowest m.p. and the highest b.h.p.—in relationship to its weight, provided, of course, that liability to breakdown be eliminated. It is not only the "best" because it is the cheapest to run, but it is necessarily superior to others that waste their fuel, since the energy so wasted may almost inevitably be regarded as harmful in one way or another. It may be absorbed in producing undue wear of the moving parts, in reducing the maximum output by developing injurious and excessive heat, in setting up objectionable vibration, in rendering foul the exhaust gases, or in a variety of similar ways.

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THE contemptible tactics which have driven the Great Western Railway motor 'bus service off the road between Helston and the Lizard have been adopted with equal success by the Madron Urban District Council in regard to the Newlyn and Penzance service, and with similar result. Practically the only difference between the two cases is that the Madron U.D.C. have cloaked their hostility to the movement under an indelicately thin veil of hypocrisy. They have not refused to roll the roads alto-

gether, but they recently mended them, and ran an iron roller over them once, leaving them in a condition which successfully prohibited motor cars or indeed any other traffic from using them. The "sweet reasonableness" of councils rendering the roads over which they preside practically impassable, even for horse-drawn traffic, in order to injure an automobile public 'bus service, is an object lesson in the enlightenment with which new movements in this country are so frequently greeted.

And the "Constant" Difficulty.

Concerning the practicability of this scheme, it will, of course, be evident that a table of "constants" would have to be worked out to suit the various systems in vogue, and it may at once be admitted that these figures would not be at all easy to arrive at. Probably a different fuel allowance per M.P. would be necessary for each of the more usual fuels employed, and this again would have to be modified for the different power systems. But, although satisfactory "constants" might not immediately result from calculations based on existing data, yet we feel sure that they could soon be arrived at in practical working, and that, ultimately, as sound a basis of comparison as can be expected would be obtained by a qualified body, and its accuracy could be maintained systematically by the proper authorities.

Concerning the basis on which such constants should be arrived at, it is unnecessary to do more than suggest that the M.P. figures ought, as nearly as possible, to denote the average b.h.p. of each type of engine using its particular fuel, for after all, the object is to arrive at the actual power that each engine may be assumed to develop under normal running conditions. As to whether the allowance of various fuels should be determined by their heat value, weight, or price, is a question that requires careful consideration, while what the allowance should be for different kinds of internal combustion engines and for various steam systems, needs the co-operation of all those qualified to express an opinion.

Of course, every first proposal must be to a large extent tentative, and open to criticism on certain points. We put the above suggestion forward well recognising this fact, but, at the same time, we hope that it may, at any rate, serve as a basis for useful discussion, and in that way lead to the introduction of more satisfactory methods of rating than those which have hitherto been adopted.

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gether, but they recently mended them, and ran an iron roller over them once, leaving them in a condition which successfully prohibited motor cars or indeed any other traffic from using them. The "sweet reasonableness" of councils rendering the roads over which they preside practically impassable, even for horse-drawn traffic, in order to injure an automobile public 'bus service, is an object lesson in the enlightenment with which new movements in this country are so frequently greeted.

GORDON-BENNETT RACE AND GRAND PRIX DE L'A.C. DE F.

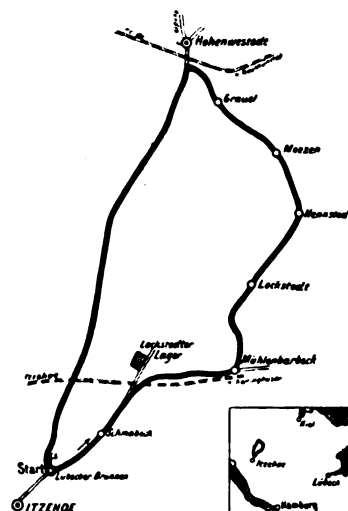
GORDON-BENNETT RACE.

THE official entries for the British Eliminating Trials are as follows :—

Entrant.	Make of Car.	Driver.
1 Mr. S. F. Edge ...	Napier...	Mr. Cecil Edge.
2 Mr. S. F. Edge ...	Napier ..	Mr. Clifford Earp.
3 Mr. S. F. Edge ...	Napier...	Mr. Arthur Macdonald.
4 Mr. John Hargreaves ...	Napier...	Mr. John Hargreaves.
5 Mr. H. Austin ...	Wolseley	Not selected.
6 Mr. H. Austin ...	Wolseley	Not selected.
7 Mr. Lionel de Rothschild ...	Siddeley	Mr. Sidney Girling.
8 Sir Alfred Hickman ...	Star ...	Mr. J. Lisle.
9 Mr. E. Lisle ...	Star ...	Mr. F. R. Goodwin.
10 Mr. A. L. Guinness ...	Weir ...	Mr. A. L. Guinness.

These are practically identical with the list which we have already published, with the exception that Mr. Sidney Girling is down to drive Mr. Lionel de Rothschild's Siddeley car.

THE Selection Trials amongst the British competitors will be held in the Isle of Man on May 30th.



German Eliminating Course.

be in by the end of this week. The expenses of these trials will have to be borne by the firms wishing to compete, and each entry must be accompanied by a fee of £300. Needless to say, protests are being lodged by some of the manufacturers in respect to the decision of the German Club. The proposed circuit for the tests, which is in Schleswig-Holstein, is shown in our sketch map.



THE AUVERGNE CIRCUIT FOR THE GORDON-BENNETT RACE AND THE GRAND PRIX.—The interesting series of photographs which we published last week gave some idea of the difficulties and peculiarities of the selected course of the Gordon-Bennett Race this year. What is regarded by most experts as the worst turning on the entire route is the "double" after leaving Rochefort. Our photograph above shows the character of this turning, at which no doubt some interesting effects should be witnessed in the efforts of the competitors to waste as little time as possible in getting round this formidable turning.

To represent the German Club it has been officially decided, some little time ago, that two Mercedes cars will take the first and second places, whilst for the third place, if more than one entry is received, eliminating tests will be enforced. A formal invitation to make entries has been made by the German Club to the various manufacturers, replies having to

MR. CHARLES JARROTT has announced that he will not drive in any Eliminating Trials, whether British or foreign, or in the Gordon-Bennett Race itself. He would probably have driven a De Dietrich on behalf of France, but the new Automobile Club de France rules, providing that drivers for France must have resided in the country for two years previous to the date of the

trials, has placed it outside Mr. Jarrott's power to take part.

IN regard to the French drivers, the following are given as likely representatives for the firms named respectively:—*Mors*, MM. Salleron, Alexander Burton, and Leger; *De Dietrich*, MM. Gabriel, Rougier, and Duray; *C.G.V.*, MM. Girardot and Giraud; *Hotchkiss*, MM. A. and H. Fournier and le Blon; *Richard-Brasier*, MM. Théry, Caillois, and Stead; *Panhard*, MM. Heath, H. Fournier, and Teste; *Darracq*, MM. Hemery, de la Touloubre, and Baras.

THE GRAND PRIX.

IN spite of the clamour in the French automobile press about all the other countries falling down in a paroxysm of delight at the announcement of the French Club's intention to run the Gordon-Bennett Cup Race at the same time as the Grand Prix on the Auvergne Circuit, there are many signs that the *grand coup* contemplated by the French manufacturers, and supported by the French Club, has failed. The German Club has been held up particularly as being enraptured with the whole idea, but with those behind the scenes it is not so apparent that the proceedings are approved with as much ardour as the German Club is credited with. In fact, it is more than hinted at that the German Club is strenuously opposed to any such thing. Belgium has, unfortunately, been ruled out of participation in the Gordon-Bennett Cup Race owing to some informality in the wording of her entry, whilst the attitude of the British Club does not remain in doubt in respect to the great handicap which would result from the dual race. That this feeling, which there is evidence is also reflected by other of the recognised clubs, is appreciated at last by those supporting the A.C. of

France, is apparent by the "hedging" which has been observable during the last few days. First a little whisper went round the Press that the decision to run both of the races together was not irrevocable, and then came a suggestion that it would be better and perhaps make matters easier and more acceptable if the Grand Prix entries were "by invitation," and restricted in numbers. To this end the work of the A.C.F. has been directed, with the result that it has been laid down that the entries for the Grand Prix should not exceed, for 1905, a total of 42, being just twice the number of cars likely to start in the Gordon-Bennett Race. The apportionment of these 42 cars to the various countries is as follows:—France, 15 (the 15 first cars in the French Eliminating Trials); other countries, 27, subdivided as follows:—Germany, 6; Great Britain, 6; Austria, America, Belgium, Italy, and Switzerland, 3 each. Should the Gordon-Bennett Race and the Grand Prix be run together, the cars running in the Gordon-Bennett Race will be counted as forming part of the full number allowed in the Grand Prix for each country respectively.

ALTHOUGH many may cavil at the large proportion of representatives allotted to France, after all it is a French race, and as originators they are free to make whatever rules may please them, whilst other countries on their part can refrain from joining in the scramble for the prizes, should the terms be considered unreasonable. But even under the new proposals, the objections, so far as the Gordon-Bennett Race is concerned, in a very large measure still hold good against the two races being run simultaneously. If the object of the French manufacturers is to wipe out the Gordon-Bennett Race, there is little doubt they will come very near success, unless the other subscribing countries assert themselves and veto the whole proceeding.

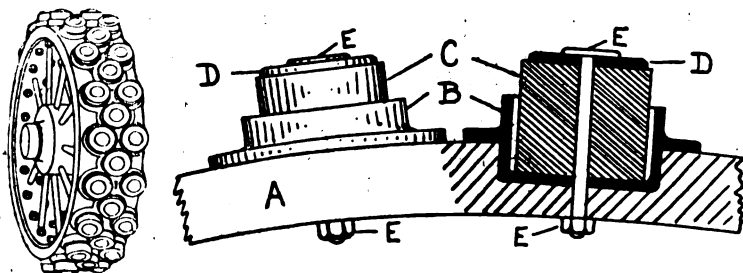


Resilient Tyres for Heavy Vehicles.—A novel construction of tyre has been brought out in America, with the object of allowing rubber to be used on the wheels of heavy vehicles, and of, at the same time, minimising the maintenance cost as far as possible. "Autraf" is the name given to this wheel, a sketch of which, as also a sectional drawing, is seen in the illustration. It is constructed of steel and is—in the experimental set under test—36 ins. diameter with a tyre width of 8 ins. Set in the surface of the steel tyre, A, are sixty shallow pockets or cups, B, 3 ins. in diameter and 1 in. deep. In each of these pockets is placed a piece of rubber, C, 2½ ins. in diameter and 2½ ins. deep, which is held in position by a ¾-in. bolt, E, passing centrally through it and through the rim of the wheel, on the inside of which it

is secured by a nut. Between the bolt head—which is flat—and the rubber, there is a large plate-washer, D, nearly as large in diameter as the rubber pad itself, so that it is the bolt-head and the washer that principally take the actual wear.

The wheel is, says the *Motor Age*—to whom we are indebted for our information—the outcome of certain experiments carried out by the Auto Traffic Company of America, and has already been tested to a certain extent in that country. A 5-ton lorry capable of carrying a 6-ton load was first fitted with twin, solid rubber, tyres, when it was found that the rear tyres lasted only about one month, the daily route being about 20 to 25 miles. The upkeep of these tyres is represented as being about £22 per month for the driving wheels, and about £2 10s. per month for the front wheels. The "Autraf" wheel, after two months' use on the same lorry, is reported to be scarcely worn at all, and the estimated cost of maintenance for the driving wheels is given as about £2 per month.

Besides being cheaper in first cost, the "Autraf" wheel is said to be an effective preventive of side slip, while it is reported that no difficulty is experienced in obtaining effective traction.



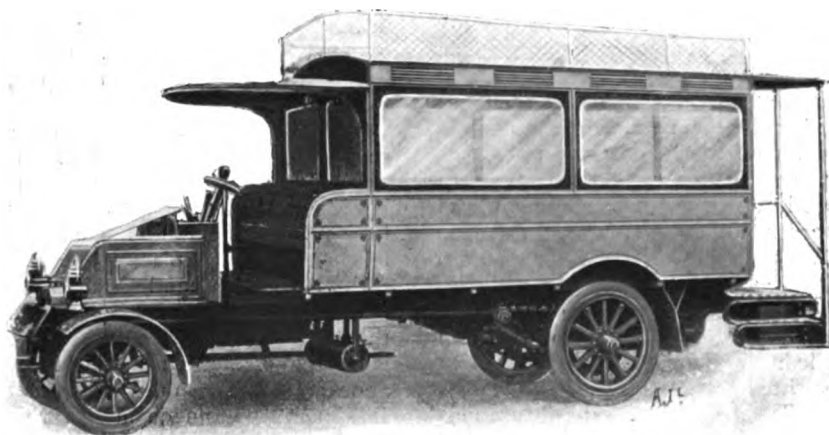
THE STRAKER-SQUIRE PETROL OMNIBUSES AND COMMERCIAL VEHICLES.

INDEX

IN view of the rapidity with which the demand for heavy vehicles propelled by petrol engines is now increasing, it is not surprising that those who have in the past devoted their chief attention so successfully to the development of steam luries should now be also introducing petrol vehicles capable of carrying considerable loads.

Doubtless, too, the recent impetus which has been given to this branch of the industry by the 'bus companies—particularly in London—has done much to stimulate development in this direction, and we are glad to see that several of our best-known English manufacturers are entering into this new field. The Straker *steam* luries have obtained such an excellent reputation for themselves in the past that the new petrol vehicles, of which we are now able to give full particulars, are sure to attract the attention they deserve, and the mere fact that Mr. Straker considers them thoroughly sound and reliable for commercial purposes must in itself be regarded as a strong recommendation by many purchasers.

These vehicles are of extremely substantial construction throughout, and are, in the main, of much the same general character as those of the Milnes-Daimler Company that we described so fully lately. As a matter of fact those which are now being supplied by Messrs. Straker and Squire are of German manufacture, and were designed by Herr Roth, who was for some years with the Cannstatt-Daimler Company. They have been built by Herr Büsing, of Brunswick, but the English firm also intend building heavy petrol vehicles for loads of from one to five tons in works of their own in this country. The standard chassis is made suitable either for use as a lorry or as an



The 24-h.p. Straker-Squire Single-deck Petrol Omnibus.

omnibus, and it is either fitted with a twin-cylinder 12-h.p. engine—when it is capable of dealing with loads of up to two tons—or with a 24-h.p. 4-cylinder engine that enables it to carry loads of about four tons, or to serve for thirty-six passenger 'buses. Quite a number of novel features are incorporated in the design, chief amongst these

being the employment of two distinct gear-boxes, both of the sliding spur-wheel type, by which no less than six forward speeds and two reverse speeds are available, by manipulating the three change-speed-levers. The object of the second gear-box—which is introduced between the usual gear-box and the differential countershaft—is to double the number of speeds, and to thus give the usual set of speeds, but with one all-round *low* gear, for the vehicle when loaded, and the same range of speeds, but with a much higher gear, when returning home light. The extra range of speeds, of course, also enables the machine to meet a great variety of conditions more favourably than usual, and renders it even more independent than are most luries of heavy roads, of awkward gradients, and of varying loads.

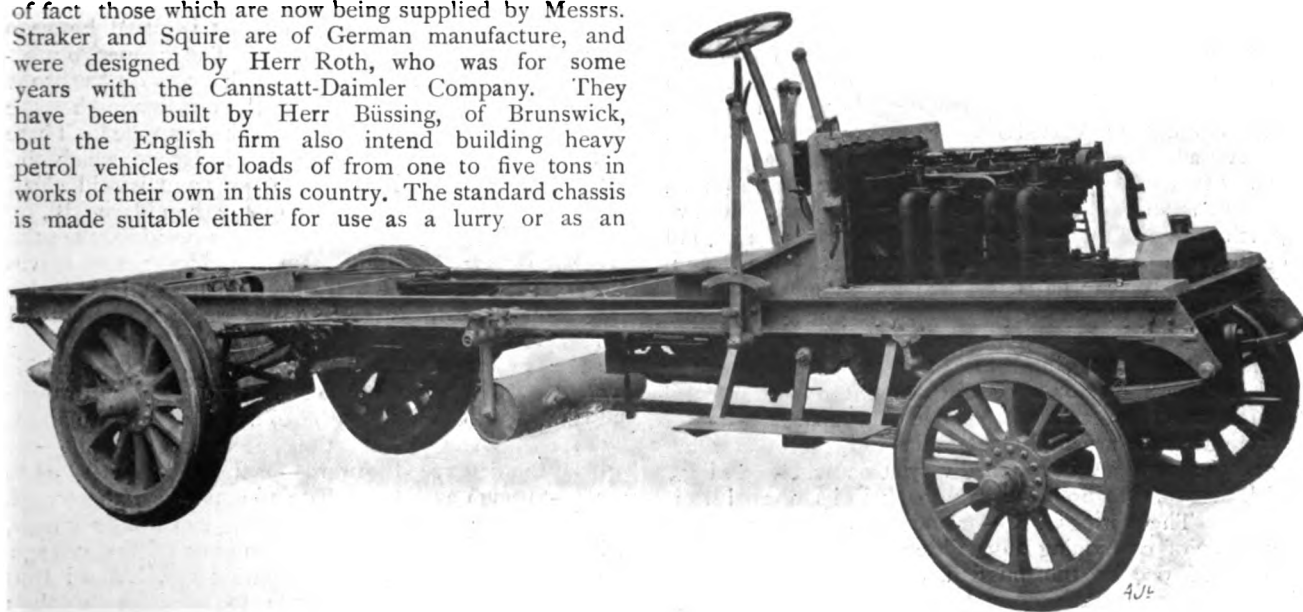


FIG. 1.—View of the 24-h.p. Straker-Squire Petrol Chassis, from the "off" side.

Another special feature of these new vehicles is the engine, which is of the slow-running vertical type, but differs materially in design from others now on the market. Most noticeable of all is the arrangement of the cam-shaft immediately above the cylinders, and of the valves, on either side of the cylinder-heads, in an inverted position to suit the cam-shaft. In this way the interior of the crank-chamber is rendered more easily accessible through the inspection doors at each side, and it is even possible to remove a connecting-rod, or to get at a piston, without otherwise dismantling anything.

Whether used as a lorry for goods, or as an omnibus for public service, Messrs. Straker and Squire intend to fit the wheels with solid rubber tyres—generally of the "Sirdar" type—in order not only to render them as silent as possible, and to reduce depreciation, but to enable the full speed capabilities of these useful vehicles to be taken advantage of. The wheel base of the standard chassis is 13 ft. 6 in., the track 5 ft. 2½ in., and the total width over the hubs is 6 ft. 5 in.; the tare weight of the chassis, when fitted with the 24-h.p. engine, is about 2 tons 7 cwt. The majority of our illustrations refer more particularly to the more powerful model, but the only difference between this and the 12-h.p. car, is that the engine has two cylinders instead of four; even the engine itself is otherwise identical. The normal engine speed is in both cases 950 revs. per min., and the bore and stroke of the cylinders are 105 and 130 mm., respectively.

Referring to the accompanying illustrations, Figs. 1 and 2 show the chassis from the "off" and "near" sides, respectively, and in Fig. 3, a view from the front is obtained—the bonnet in all cases having been removed to show the engine. In other illustrations, a complete single deck omnibus for twenty passengers, and a complete lorry equipped with the special testing body it has for the Club long-distance Trial, are shown. Figs. 4 and 5 give a side elevation and a plan, respectively, and in these drawings the twin-cylinder engine is indicated, while in Fig. 6 we give a diagrammatic drawing showing the arrangement of the transmission mechanism—from the main-clutch to the sprockets for the side chains—in plan.

In some of these illustrations, the petrol tank is shown fitted beneath the frame at the back, and a pressure-feed system is indicated for forcing the fuel up to the carburettor, but this arrangement has now been discarded in favour of a gravity-feed, for which the 20-gallon fuel tank is fitted beneath the driver's seat, instead.

A glance at the illustrations already referred to will show that the chassis has a very substantial main frame, which is supported on semi-elliptic side-springs above each axle, and that—except for the presence of a second gear-box about the differential countershaft—the general disposition of the parts is much the same as on most chain-driven vehicles. It will, however, be noticed that the back springs are connected with the frame by pins that ride in slots, and that the radius-rods are also slotted to allow for a certain amount of forward and backward movement of the axle. Projecting rearward from the axle, are additional radius-rods, between which and the frame are introduced very strong volute springs, R^1 , that tend to hold the axle back in its normal position. The springs, R^1 —arranged in this way—are capable of cushioning any sudden shocks that may be imposed on the transmission mechanism, since it is they that maintain the normal tightness of the side chains.

The artillery wheels can either be fitted with single or

double rubber tyres, and those at the rear have a metal cradle that forms part of the chain-wheel and is fixed direct to the felloes—thus preventing any driving strain from being imposed on the spokes. The front wheels are connected together, for steering, in the usual way, and the cross-rod lies behind, instead of in front of, the solid axle. In Fig. 3, the type of steering-head employed is clearly visible, and it will there be seen also that the axle—which is in keeping with the rest of the machine—is of a very substantial form.

With the engine, we propose to deal separately presently, but would now point out that it is rendered particularly accessible when the bonnet is removed, both because the whole of the valve-gear is above it, and also because the radiator is fixed on a comparatively low level in front. By placing the radiator in this position, with the starting handle passing through its centre, no belt or other indirect drive is required for the fan, but the fan is fixed direct to the crank-shaft. The radiator is built up of long, thin, flat tubes, though in external appearance it resembles those of the honeycomb type. Its top and bottom chambers, which form a part of the framework around the tubes, are each made in two parts, so that they can be opened up completely for cleaning purposes, or for replacing an injured tube. The radiator itself is of sufficient capacity to carry the whole of the water required for the circulating system.

The Transmission Mechanism.

Referring more particularly to Fig. 6, it will be seen that the main-clutch is of the ordinary cone type, and that the large, leather-faced cone, H , is fixed to the first-motion-shaft, H^2 , by the coupling, H^1 . The entire shaft slides longitudinally to disengage the clutch. This first gear-box provides three forward speeds and a "reverse," and is operated by a pair of hand-levers, L , which are connected with independent sliding-members on the first-motion-shaft. The second-motion-shaft, J^1 , lies to the right of the shaft, H^2 , and the oil-tight gear-box, J , is formed by two castings, the joint between which passes through the four bearings. The first-motion-shaft is connected with the combined clutch and brake-pedal, H^3 , by the rod, H^9 , and by the pivoted lever, H^3 ; the clutch is normally held in engagement by the stationary clutch-spring, H^4 , that is fitted between the gear-box and the lever, H^3 . The connection between the pedal, H^3 , and the brake that acts on the front end of the second-motion-shaft, J^1 , is so made that the clutch is withdrawn before the brake is applied. There is, thus, one position for the pedal, H^3 , in which the clutch is disengaged but the brake band is still clear. Provision is made by means of the hand-lever, B^7 , on the dash, for locking the pedal in this position when the vehicle is at rest, and this same hand-lever also serves for regulating the normal speed of the engine; this lever, in fact, constitutes the only engine-control afforded the driver.

The sliding wheel, H^1 , on the first-motion-shaft is connected with one of the change-speed-levers, L , through the sliding bar, L^2 ; it can be either brought into mesh with the wheel, J^3 , on the second-motion-shaft—for giving the first speed forward—or it can be slid so as to gear—through an intermediate pinion—with the wheel, J^2 , to give the "reverse." The other two sliding wheels, H^7 and H^8 , are connected with another of the change-speed-levers, L , through the operating bar, L^3 , and thus either of them can be made to mesh with their corresponding wheels, J^1 and J^6 , on the second-motion-

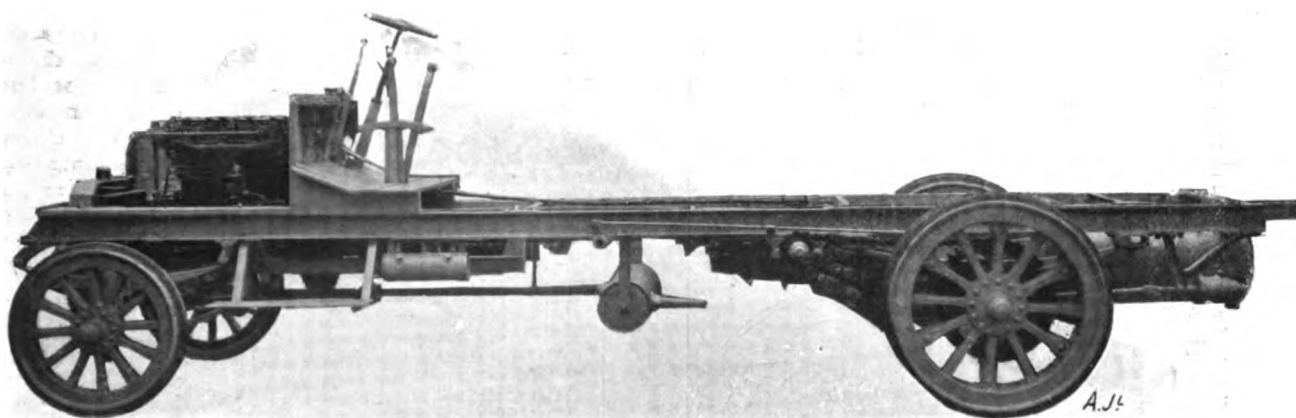


FIG. 2.—The Straker-Squire 24-h.p. Petrol Chassis, from the "near" side.

shaft—for giving the second and the third speeds respectively.

The second-motion-shaft, J^1 , is connected with the change-speed mechanism in the other gear-box, N , by the propeller-shaft, M , which has universal-joints at both ends. The propeller-shaft thus drives the short longitudinal shaft, N^1 , which carries the bevel-pinion, N^2 , and is provided with a thrust-bearing, N^3 , at its rear end. The bevel-pinion, N^2 —instead of driving the differential gear direct—meshes with the bevel-wheel, N^4 , on the intermediate transverse shaft, N^5 , and this intermediate shaft has two sliding spur-wheels, N^6 and N^7 , either of which can be made to drive the differential gear. These two spur-wheels are connected together by a sleeve, which is engaged by a fork, L^4 , and this fork is controlled—through the rod, L^1 —by the third change-speed-lever, L , lying alongside the driver. In this way, the driver can either bring the smaller wheel, N^6 , into mesh with the larger wheel, P^3 , on the differential shell—thus giving a low gear-ratio—or he can bring the larger wheel, N^7 , into mesh with the smaller wheel, P^4 —thus giving a gear-ratio which is twice as high as before. In the former case, changes of speed in the main gear-box will represent speeds on the road of $1\frac{1}{2}$, $4\frac{1}{2}$, and 7 miles per hour (at normal engine speed), or, in the latter case, the vehicle will travel at 3, 9, and 14 miles per hour, respectively, for the 1st, 2nd, and 3rd speeds forward.

The differential-gear, P^5 , is contained in the same oil-tight casing, N , as the mechanism driving it, and this gear-box is supported by a special underframe, N^8 , that "floats" about the countershaft, and is only otherwise anchored to the frame by the swinging links, N^9 , at each side. The countershaft itself is formed by a solid shaft, P^1 , that runs right through from end to end; it merely revolves idly inside the sprocket, P , on the left side, but is rigidly fixed to the sprocket, P , on the right side. The left-hand sprocket is connected by

the sleeve, P^2 , with one of the concentric bevel-wheels inside the differential-gear, P^3 , and the shaft, P^1 , is, of course, fixed to the other concentric bevel wheel.

Both the gear-boxes form oil-tight casings, and have phosphor-bronze bearings—lined with white metal—for the shafts, and all the bearings are of ample size to ensure durability. The gear-wheels themselves are made of Siemens-Martin steel, and are carefully hardened to minimise wear as far as possible.

The Brakes.

In addition to the foot-brake, K , on the front end of the second-motion-shaft, J^1 (to which we have already referred), very powerful brakes are provided on the two driving wheels. These brakes are operated by the side-lever, Q , through the compensating device, Q^1 , (Fig. 5)

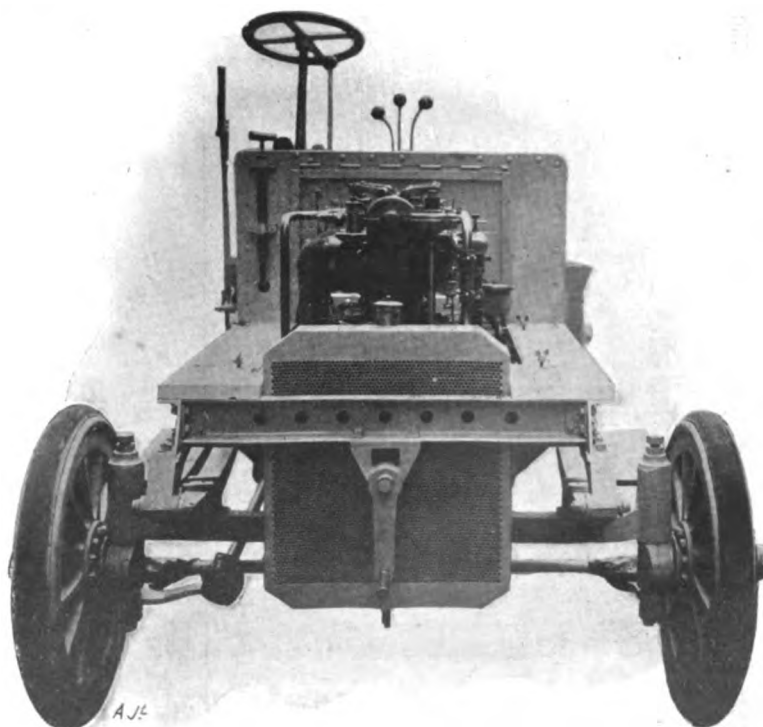
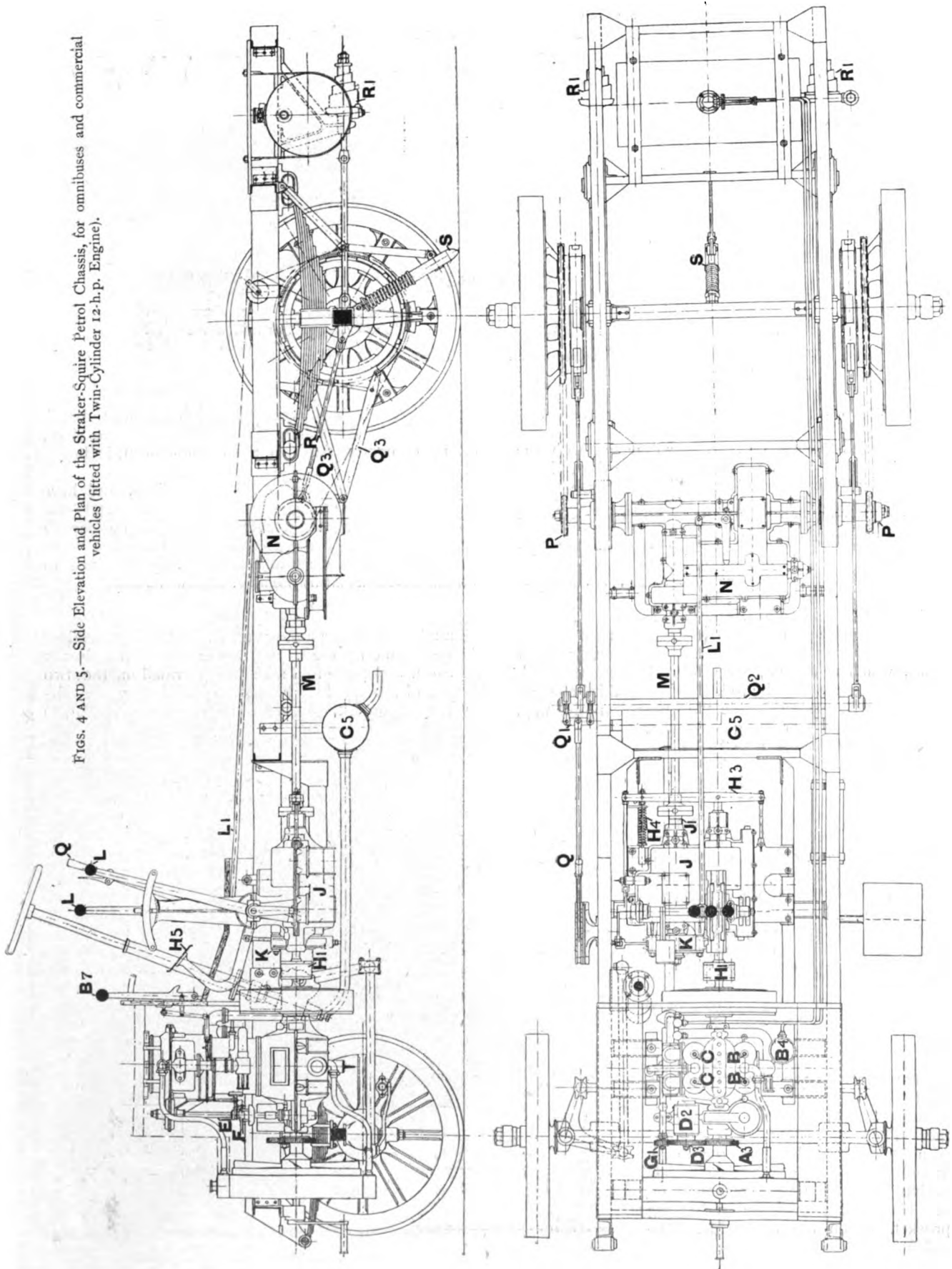


FIG. 3.—Front view of the 24-h.p. Straker-Squire Petrol Chassis.

FIGS. 4 AND 5.—Side Elevation and Plan of the Straker-Squire Petrol Chassis, for omnibuses and commercial vehicles (fitted with Twin-Cylinder 12-h.p. Engine).



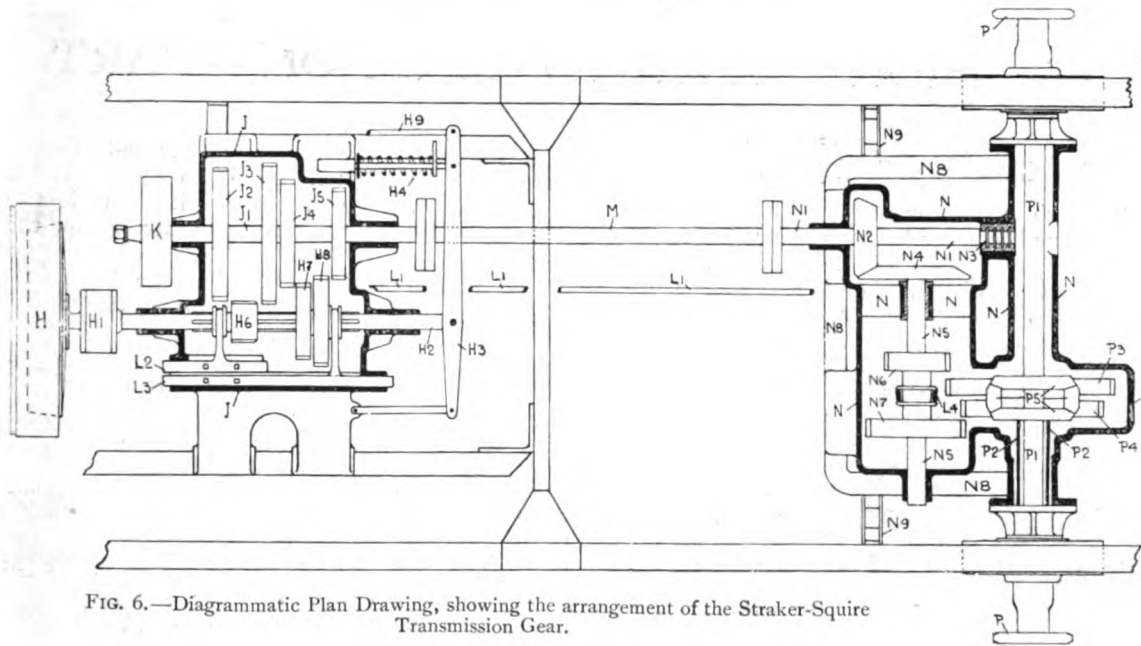


FIG. 6.—Diagrammatic Plan Drawing, showing the arrangement of the Straker-Squire Transmission Gear.

which equalises the pull on the rod that passes direct from the one sleeve to the brake on the right, and on the transverse rockshaft, Q^2 , that actuates the brake on the left. Each of the brake-bands is anchored at both ends to the main frame by torque-rods, Q^3 , and an extremely powerful toggle action—which also tends to hold the band clear of the drum—is introduced between the two ends. It will be noticed that the design of

the brakes is such that they hold equally well in either direction.

Fitted centrally to the back-axle is a strong sprag, S , for preventing the vehicle from running backwards on a hill. It has a cushioning spring introduced into it for eliminating the shock when it comes into use.

(To be continued.)



The Crossley Cars are now getting into regular everyday work, and some very beautiful carriages have already been put on the road by Messrs. Charles Jarrott and Letts, Limited, who have the sole control of these splendidly-built British vehicles. Mr. and Mrs. Claude Borrett's 22-28-h.p. vehicle of this type seen in our picture is a specimen of one of these handsome vehicles. Mr. Borrett is an enthusiastic automobilist, and has been for some time the owner of a number of cars. Before starting last week for the South of France, he took his new Crossley for a preliminary canter in England, over about 2,000 miles. Mr. Borrett will have the pleasure of being the first to introduce the Crossley Car to the Riviera. Although the chassis is of the standard length, it will be noticed that a neat carriage body with side entrance is arranged, thereby demonstrating that a side entrance carriage body can be fitted without necessarily increasing the length of the chassis. We learn that Mr. Borrett, who is driving right through to the Riviera, has already got over a considerable part of his run without having experienced the slightest trouble either with engine or mechanism.

HIGH-TENSION MAGNETO IGNITION.—PART XI.

THE MURRAY HIGH-TENSION MAGNETO IGNITION.

A SYSTEM which has given very good experimental results, but which has never been put on the market—for the simple reason that the inventor considers a low-tension ignition system better adapted for his particular

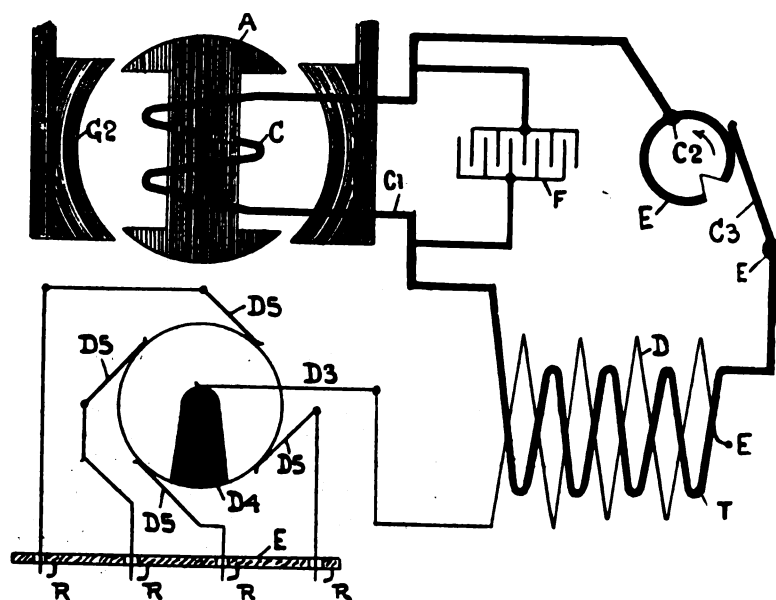


FIG. 28.—Diagram of Connections for the Murray High-Tension Magneto Ignition System.

engine—is the Murray high-tension magneto ignition. It has been designed by Mr. Blackwood Murray, M.I.E.E., to whom we are indebted for the data and illustrations accompanying this article. As a system, it possesses many points of interest, and does, as it were, supply one of the missing links in the way of possible combinations of the elements that form the circuit for high-tension ignition from magnetos. The Murray system is amongst those employing an external induction-coil in conjunction with a low-tension magneto—of which class the Eisemann, already described by us, is the best known example—and it is chiefly noticeable for the fact that the induction-coil has no iron core. In general, the apparatus employed in the system is similar to that which is used in the Eisemann ignition, and, therefore, the main construction details call for no special comment.

Fig. 28 gives a diagram of the connections for the Murray system, and in this diagram the reference letters correspond with those used throughout this series of articles. With the exception of the contact-breaker, C² and C³, all the elements in the circuit have been diagrammatically represented in the same manner as hitherto. The actual construction of the contact-breaker is indicated more clearly, it consisting of a revolving disc, having a notch cut in its periphery, and a flat brush which presses tangentially against it. Such a device ensures a very quick break of short duration, and has been found to answer its purpose—to be explained presently—in a very satisfactory manner. The disc is mounted on, and is in electrical connection with, the

armature spindle, so that it thus forms the “earthed” end of the armature-coil. The other end of the armature coil is connected directly to the primary of the induction-coil, which may—since it has no iron core—be termed a Tesla coil, and the other end of this coil passes straight to the brush, C³, forming the contact-breaking lever, which thus completes the circuit. Although dissimilar in actual construction, the contact-breaker performs precisely the same functions—of breaking the primary circuit—as those on the machines already described.

A close comparison between the circuit for the Murray system and that of the Eisemann system (see Fig. 17) will show that they are more similar than might at first sight appear, and that the chief difference really lies in the fact that the contact-breaker, as arranged in the Murray system, never allows the armature to be short-circuited on itself. In both systems the primary winding, T, of the induction-coil is directly connected in series with the armature-coil, C, and in both systems the condenser, F, is placed as a shunt across the armature-coil—between it and the primary winding of the induction-coil—so that each of these form parallel circuits for its discharge. In the Eisemann system, the contact-breaker is formed as a shunt directly across the armature, whereas in the Murray ignition it is in series with the armature-coil and the primary winding, so that when open it entirely cuts off the armature current from the primary winding of the coil. The

reason for using the particular type of contact-breaker already described, will now be obvious, because it will be recognised that it is necessary for the contact-breaker to be closed before the condenser can discharge through the primary winding of the induction-coil, and that it is desirable that the circuit should not remain broken longer than is necessary to charge the condenser.

The contact-breaker is set relatively to the armature-shaft so that the armature current is interrupted at the best position—which is, as has been explained, slightly after the theoretical “maximum.” At the instant of

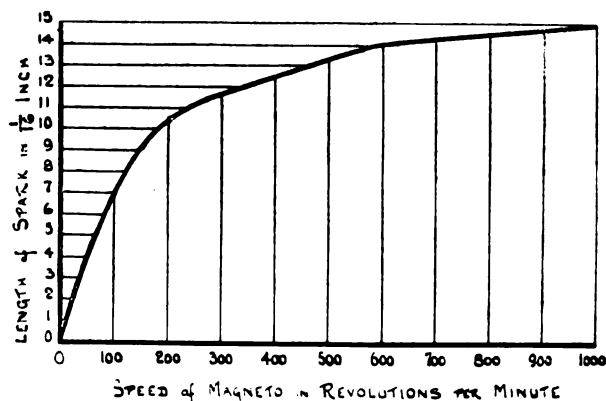


FIG. 29.—Diagram showing the variation of length of spark obtained at various speeds with the Murray High-Tension Magneto Ignition.

"break," the armature current—which hitherto would have been flowing through the primary of the induction-coil—is suddenly interrupted, and the self-induced current flows in consequence into the condenser, F, which is instantly charged. Almost simultaneously, the contact-breaker closes the circuit again, and the condenser discharges through the primary of the induction-coil, augmenting the secondary spark in the manner described in our introductory chapters. The condenser obviously has two alternative paths for its discharge, one through the armature-coil, and the other through the primary of the induction-coil, and it is due to the absence of the iron core in the induction-coil that the condenser discharge chooses the latter path. The way in which an iron core in a coil acts as a spring buffer against the rapid variation of current in that coil has already been explained, so that it will be quite evident that the removal of the iron from one of two such alternative paths for a current will have a considerable effect on the proportional quantities of electricity which flow through either circuit. The result in the Murray system is that practically all the condenser discharge passes through the primary winding of the induction-coil, and, owing to the reduced self-induction, the consequent loss of magnetism can be compensated for by the increased rapidity of the condenser discharge—which thus renders the smaller degree of magnetism more effective.

As with all electric phenomena, the successful accomplishment of desired results depends almost entirely on the accurate balancing of the various counteracting influences. Such balancing has nothing of mechanical simplicity, and is difficult to arrive at by calculation beforehand. It is difficult, therefore, to give even theoretical values to different systems, so that the results of practical experiments are of additional interest. The results obtained by Mr. Murray with his ignition system are shown in a very practical manner in Fig. 29, where the spark-lengths obtained at various speeds of the magneto are graphically shown in the form of a curve. At first, the increasing speed of the magneto has a great effect on the spark-length, but afterwards—as might be expected—the effect of increased speed is less. The spark-gap was—in the experiment—reduced in each case until the spark became permanent and reliable. At 100 revs. per min. as much as $\frac{7}{8}$ -in. spark was obtained, and at 1,000 revs. per min. this was only increased to $\frac{1}{8}$ -in. That is to say, an increase in the speed in the ratio of 1 to 10 has the effect of increasing the spark length only in the ratio of 1 to 2. A disproportion between these ratios is to be expected, for in the first place a very large increase in voltage is, it is well known, accompanied by a relatively small increase in length of spark, and what is not accounted for in this way may be attributed to the disproportion which probably exists between the voltage and the speed.

Lately Mr. Murray has experimented with the production of a high-tension spark from the Albion low-tension magneto, shown in Fig. 30. The arrangement of the circuit was the same as that used in the Eisemann system (Fig. 17), and, although the apparatus was not balanced properly, some excellent results were obtained. The Albion low-tension magneto is of somewhat peculiar construction, and has already been described by us in our issue of Nov. 28th, 1903. Two plain bar magnets, G, are mounted on a casting, which is carried direct by a projection of the engine crank-shaft. Cast-iron pole pieces, G², are bolted to the ends of the magnets, G, so that they partly embrace the armature-core, A. The

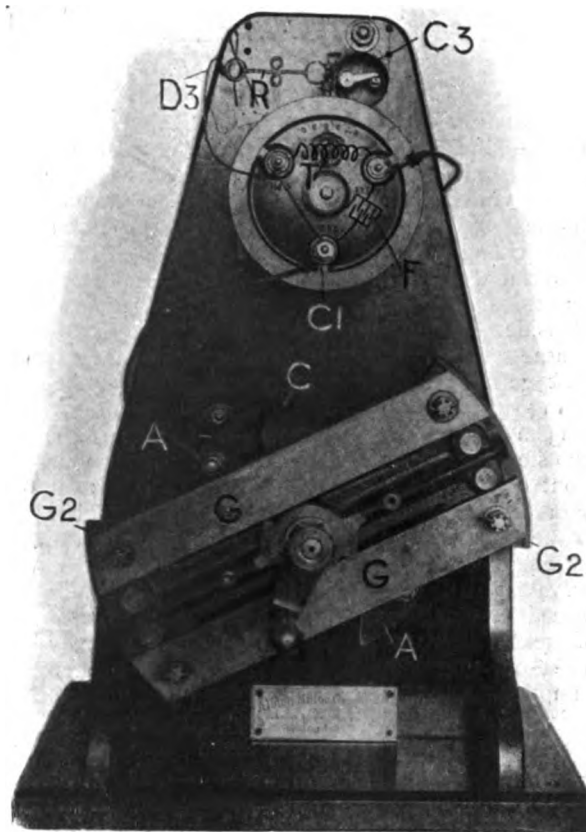


FIG. 30.—View of the Albion Low-Tension Magneto which has been experimentally used in conjunction with an Induction-Coil for the generation of High-Tension Electricity. In this illustration the Spark Gap is formed by a Geissler Tube (R), which the magneto was capable of illuminating.

armature-core, which is laminated in the usual way, takes the form of a circular horseshoe, or ring, having a gap in it, and its position is concentric with the shaft of the revolving magnets. The armature-core, C, is wound on the centre of the core, directly opposite the gap. As the magnets revolve, their poles, G², simultaneously come opposite to the armature-coil, C, and the gap in the armature-core, A, at which instant the current in the armature-core assumes its theoretical maximum value, and the circuit is broken. Although somewhat curious in shape, the armature, A, of this magneto is nothing but an ordinary H or shuttle-wound armature—such as is used on the magnetos already described. Instead of the transverse part of the core, on which the coil is wound, being central, it is placed to one side, so that—together with the two extremities—it forms a nearly complete ring of metal. In Fig. 30 it will be noticed that, instead of an ignition plug, a Geissler tube, R, has been fitted, which the high-tension discharge was made to illuminate.

Table of Reference Letters for the Murray High-Tension Magneto Illustrations.

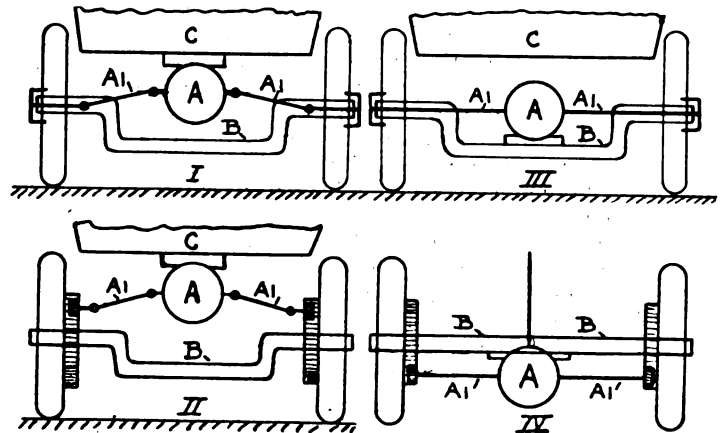
A Armature core.	D ³ Distributor brushes (high-tension).
C Armature winding.	E Earth.
C ¹ Armature winding (live end).	F Condenser.
C ² Armature winding (earth end).	G Magnets.
C ³ Contact-breaker.	G ² Magneto poles.
D Secondary winding.	R Ignition plugs (Geissler tube in Fig. 30).
D ³ Feeder brush.	T Primary winding on coil.
D ⁴ Distributor segment (high-tension).	

THE PARIS SALON, 1904—PART V.

(Conclusion.)

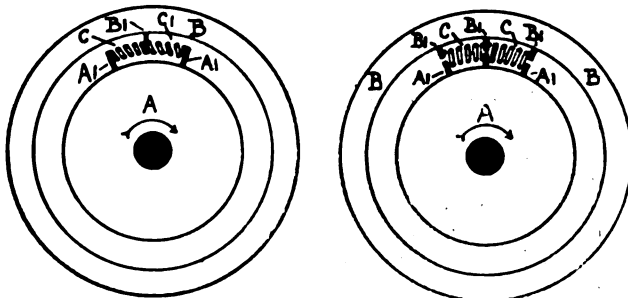
COMING now to the question of steering gears, perhaps the most noticeable deviation from previous practice is the adoption of what may be called "internal" steering-heads on the front axle, in lieu of the well-known bifurcated pattern. This change applies particularly to the more powerful cars, and is another instance in which Mercedes practice has been more or less copied. Considerable improvement both in strength and neatness is secured, while there is less chance of dust getting into the bearing surfaces. Another change that has become very general is the arrangement of the cross-tie rod—that couples the two steering heads together—behind, instead of in front of the axle, where it is less liable to become damaged or fouled in the event of collision, and is further more conveniently out of the way of the starting-handle. A curious fallacy appears to be prevalent that the rod fixed in this position is placed in compression, and that if fitted in front of the axle it works in tension, but we need hardly point out that there is no basis for any such assumption, since, whichever position it occupies, it is called upon to work in compression *and* in tension to an almost equal extent, though at different times. Of the actual steering-gear mechanism, itself, we are unable to say much, since it is impossible at an Exhibition of this kind to obtain very full information concerning constructional details in the limited time available, and an observer is unable to ascertain the necessary data from the outside appearance of the casing containing it. We did, however, notice that on the De Dietrich and Clement cars, the operating lever-arm that projects downward from the casing is supported on *both* sides, instead of being allowed to overhang, as it usually is.

Nothing is more satisfactory than the obvious extent to which attention has been paid to the improvement of brakes. Not only are the brake mechanisms, as a rule, more substantial and powerful, but considerably more care has been taken to facilitate adjustment, to prevent the brake-bands from rubbing against the drum when

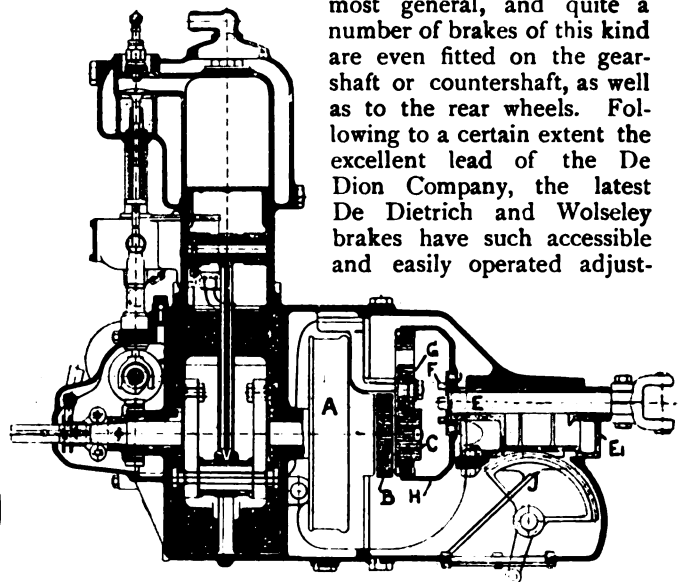


THE PARIS SALON.—Diagrammatic sketches illustrating four different methods of using stationary solid back axles, but of dispensing with side chains for driving the road wheels. In these diagrams, A represents the casing enclosing the differential-gear; A₁, the two differential-shafts; B, the solid, stationary axle; and C, the main-frame. Figs. 1, 2, and 3, which are elevations, represent the "De Dion," the "Pillain," and the "Aries," respectively, while Fig. 4, which is a plan, indicates the arrangement adopted by Chenard and Walcker, and by the C.I.E.M. Co. All these systems are referred to in our article.

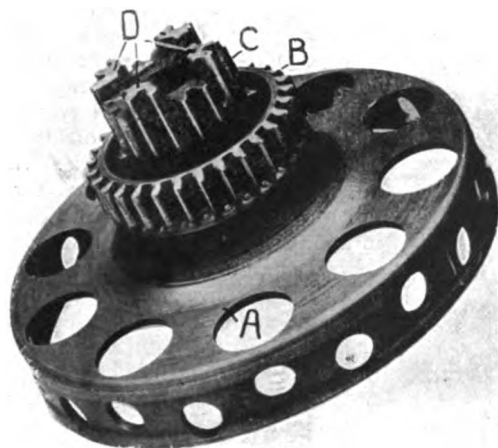
not in use, and to take (in a proper manner) the strains that are imposed by the brakes. Those of the internal expanding type are by far the most general, and quite a number of brakes of this kind are even fitted on the gear-shaft or countershaft, as well as to the rear wheels. Following to a certain extent the excellent lead of the De Dion Company, the latest De Dietrich and Wolseley brakes have such accessible and easily operated adjust-



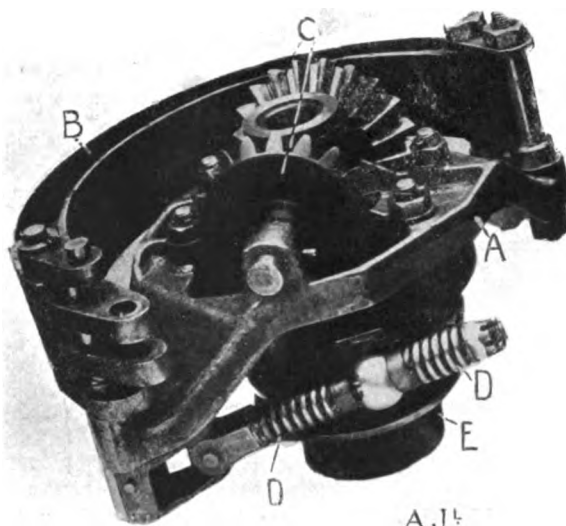
THE PARIS SALON.—Diagrammatic sketches showing the ordinary and the special "spring drive" devices fitted to the Gillet-Forest and the Cornilleau cars, respectively. In the former case, the projecting lugs (A₁) from the "driving" member (A) lie alternately between the lugs (B₁) that form part of the driven member (B), so that only half the helical springs (C) are employed at a time, in either direction of rotation. In the other case the two sets of lugs (A₁ and B₁) lie opposite one another, and all the springs (C) are thus brought into play irrespective of the direction of rotation.



THE PARIS SALON.—Longitudinal section of the single cylinder Cohendet Engine, combined with the Change-Speed-Gear that gives three forward speeds and a "reverse." Mounted on the crank-shaft is the clutch (A) and the two spur wheels (B and C), which are also shown in another illustration. The driven shaft (E) revolves inside an eccentric bush (E') that is also free to slide longitudinally, and to this shaft are fixed a jaw-clutch member (F) and an internally-toothed gear-wheel (H). An intermediate pinion (G) at all times meshes with the wheel (C). A toothed quadrant (J) and the bush (E') are so arranged that the wheel (H) can be brought into mesh, alternatively with either of the wheels, G, C, or B—for the "reverse," the first, or the second speed—and, as a further alternative, the shaft (E) can be locked direct to the crank-shaft by the jaw clutch (F).



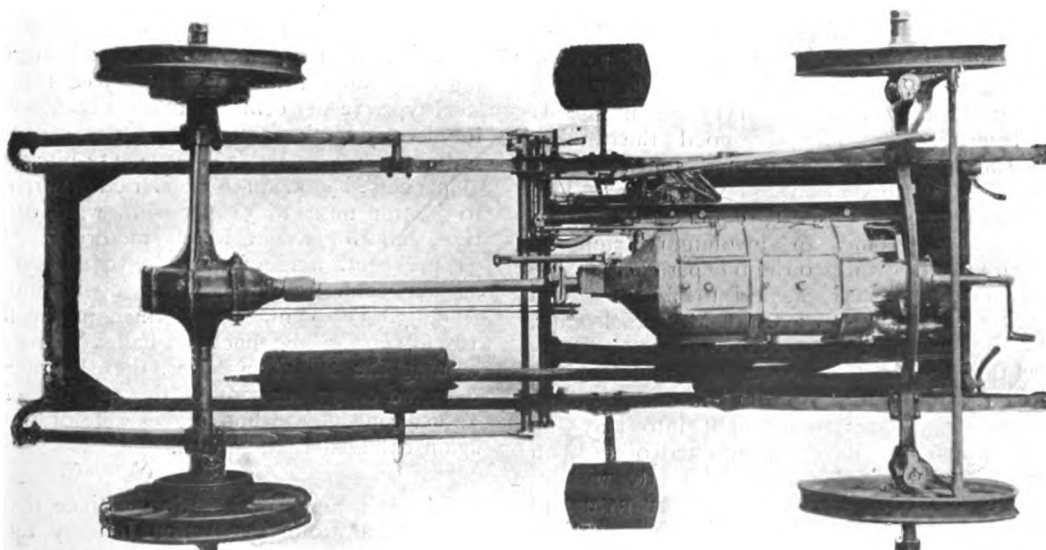
THE PARIS SALON.—Part of the Cohendet Change-Speed-Gear. The casting (A), which forms one member of the main clutch, is mounted on the crank-shaft, and to it are fixed two spur-wheels (B and C), with either of which an internally-toothed gear-wheel on an eccentrically mounted, and slidable, driven-shaft can be brought into mesh. The smaller wheel (C) has four jaws (D), for engaging direct with corresponding jaws on the driven shaft; these give the top speed.



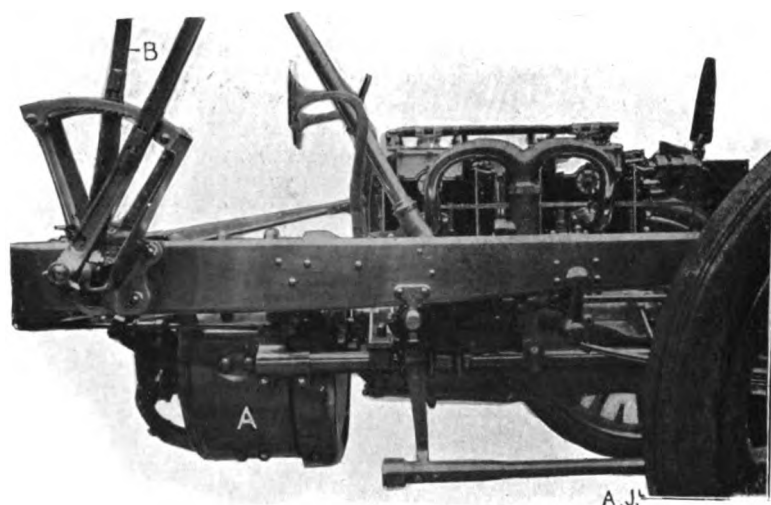
THE PARIS SALON.—Part of the Cohendet Reversing-gear, which is combined with the crank chamber on the marine motors. The casting (A) rides freely upon the shaft, and carries a brake band (B)—of which only one half is shown—and also two bevel planets (C). These planets mesh with one wheel on the crank-shaft, and another on the propeller-shaft, and so give the "reverse" when the casting (A) is held stationary. The brake-band (B) has an external face for this purpose, and it also has an internal face for gripping a drum on the shaft and so giving the "ahead" by locking the entire gear. The band (B) is normally held clear by two springs (D), but can be made to expand or contract by the sliding sleeve (E).

ments that there is no excuse for any driver meeting with an accident owing to faulty adjustment. The Mors and the Roy cars have foot *and* hand-operated brakes acting direct on the road wheels, as has been the usual practice on the Wolseley cars for a long time, while in the case of the Mors, an additional foot-operated countershaft brake is also available. This practice of fitting foot-brakes in duplicate—again adopting the Mercedes lead—is evidently spreading, for on the

Fiat there is one acting on the second-motion-shaft as well as on the countershaft, while on the Rochet-Schneider, Isotta-Fraschini, Brouhot, and Berliet, there are two independent brakes on the countershaft. For a different purpose—viz., in order to prevent the foot-



THE PARIS SALON.—A twin-cylinder 12-15-h.p. "Cohendet" Chassis from beneath, showing the combined gear-box and crank-chamber. The engine has four enclosed flywheels forming the crank cheeks, and there is an internal expanding clutch between it and the special gear mechanism.



THE PARIS SALON.—View of the engine and dynamo (A) on the 20-24-h.p. "Krieger" Petrol-Electric Chassis. The dynamo, which is coupled direct to the crank-shaft, is of the six-pole type, and the current from it is distributed by the controller to the two motors driving the rear wheels. The controller is fixed across the chassis behind the change-speed-lever (B), which operates it and is arranged like the ordinary gear lever on petrol vehicles.

brakes from acting through the differential gear—the De Dietrich Company have adopted the well-known English Daimler arrangement of fitting two compensating brakes on the countershaft, and in this respect the Radia chassis is also similar. Another noticeable feature of the brakes, this year, is that many of them have the friction surfaces riveted to the drums, so that they can be renewed without necessitating a new drum.

We were glad to notice the increased extent to which some kind of sprag device—for preventing a vehicle from running backwards when ascending a steep hill—is being taken up by the majority of makers. Last year an attempt was made to emphasise the improvements in the brakes by omitting to fit a sprag of any kind—it being pointed out that the brakes were double-acting and reliable. This was justified to a great extent by the unsatisfactory character of the ordinary "road-prodding" sprag then in vogue, and by the risk that is run of damaging the car if the driver omits to take a ratchet and pawl mechanism out of action before using his "reversing" gear. But, however good the brakes may be, a sprag is always useful for starting after a stop has been made on a very steep hill, while, in addition to this, it renders the vehicle considerably safer, should an involuntary stop be made, at such a time, owing to the inexperience of the driver. We were especially pleased to find that the latest Mercedes car, and also the C.I.E.M. vehicles, not only have—like many others—ratchet-and-pawl sprag-devices, but that they are moreover so fitted that the pawl is automatically withdrawn from the ratchet-wheel when the "reversing"-gear is brought into play—an arrangement which we have strongly advocated on several occasions in the past, although hitherto without avail. On the Mercedes car, the automatic nature of the mechanism employed has been carried even further, with the result that it requires no attention from the driver, but is at all times ready for use. On the C.I.E.M. car there is a small hand-lever, alongside the gear and brake levers, for operating the ratchet

device, thus avoiding the tiresome—and sometimes dangerous—search that has to be made, on some vehicles, to find the operating-cord when it is most wanted.

In concluding this general analysis of constructional details, it only remains to refer to a somewhat novel type of vehicle that has been on view on the stall of Messrs. Luc, Court et Cie.—the manufacturers of the "Lacoin" "voiture démontable." In this car, the main frame is made in two parts, the front portion with engine, gear, dash, and the front wheels, the back part with the live-axle and propeller-shaft. The side members of the rear portion fit close up against, and overlap, those of the front portion, in such a way that the two can be locked together firmly in a few moments, while, at the same time, connection is made between the change-speed-gear and the propeller-shaft, by a kind of flexible coupling between the two. The object of this arrangement is to enable the owner to use various types of body—each of which is mounted on its own live-rear-axle—and to be able to substitute the one for the other at any time.

The design also lends itself to a variety of other purposes, as for instance, for coupling a dynamo to the engine for furnishing electric light in a country house.

The following statistical data, compiled at the opening of the Salon by one of our French contemporaries, from the cars and chassis exhibited by 121 manufacturers, may be found interesting by some of our readers:—Relating to the power of the motors, 56 per cent. were above 20-h.p., 37 per cent. were between 8 and 20-h.p., and only 7 per cent. were below 8-h.p. Concerning the number of cylinders, 72 per cent. of the engines had 4 cylinders, 9 per cent. 1 cylinder, 8 per cent. 3 cylinders, 6 per cent. 2 cylinders, and 5 per cent. more than 4 cylinders. No less than 94 per cent. of the engines were controlled from the inlet, as against 4 per cent. from the exhaust. Of the ignition systems, 44 per cent. were of the low-tension magneto type, 36 per cent. high-tension magneto, and 16 per cent. employed batteries. Regarding main frames, there were 70 per cent. of the pressed-steel type, 12 per cent. armoured wood, and 14 per cent. tubular. Of the clutches, 42 per cent. were of the ordinary cone type, 36 per cent. internal cone, and 20 per cent. had metal-to-metal friction surfaces. Relating to the transmission, 51 per cent. were of the live-axle type, and 48 per cent. were chain-driven. Of radiators, 31 per cent. were of the honeycomb type. Of fans, 44 per cent. were fitted close up behind the radiator, while 38 per cent. were formed in the flywheel, and 18 per cent. of the machines had no fans at all. Concerning the induction valves, these were mechanically-operated on 73 per cent. of the engines. No less than 72 per cent. of the hub brakes were of the internal, as against the external, pattern.



Licences and Registration.—Since the coming into force of the Motor Car Act on January 1st, 1904, up to December 31st last, 12,000 licences were issued to drivers of motor cars in the county of London by the L.C.C. During the same period 8,250 motor cars and motor cycles were registered.

HEAVY MOTOR CAR REGULATIONS—Further Views of Leading Engineers Concerning the New Regulations.

The Views of Colonel R. E. Crompton, C.B., R.E., etc., Chairman of the Motor Van Users' Association.

"After a long delay these regulations have been issued, together with a circular letter to the Clerks to the Councils and Town Clerks respectively of the Local Authorities who are Registering Authorities under the Act.

"It will be remembered that the Departmental Committee appointed by the Local Government Board on the 14th January, 1904, consisting of the Rt. Hon. Henry Hobhouse, M.P., as Chairman, Sir William Arrol, H. C. Munro, Herbert H. Law, George F. Deacon, and H. Graham Harris as members, commenced their sittings shortly after that date, and after taking evidence from the County Council and Municipal Corporations, London County Council, Liverpool Town Council, Corporation of Glasgow, the Canal Association, and the Roads Improvement Association, all of whom may be classed together as those interested in the maintenance of the roads, and of the Motor Van and Wagon Users' Association, the Society of Motor Manufacturers and Traders, the Automobile Club, the Great Western and North-Eastern Railway Companies, the London General Omnibus and London Road Car Companies as manufacturers and users of motor vehicles, it issued its report with very reasonable promptitude on the 21st April, 1904. Their report included recommendations on which the contemplated regulations should be based, and the Local Government Board issued their draft order shortly afterwards, but the excuse for the long delay which has since taken place in issuing the order and circular letter has been that it was necessary to obtain further views and concurrence of the local authorities concerned. To everyone concerned this long delay appears to be inexcusable; it is only another instance of the extremely slow methods of Government Departments in dealing with what after all is a comparatively simple and easy matter, moreover the chief object of making regulations contemplated in any Act of Parliament which deals with commercial matters is to facilitate procedure and make more rapid and easy the issue, alteration and variation in rules of this kind. As it is, the issue of these regulations has taken quite as long as the framing and carrying of a special Act of Parliament, and this is not at all as it should be. The electrical profession for years past have complained of the same tardy and restrictive action on the part of the Board of Trade in the issue of their regulations governing the use of electricity, and the Board of Trade has been blamed, and not without reason, as one of the contributory causes to the backward condition of the electrical industry in this country as compared with that in other countries.

"Turning now to the regulations themselves, it would be most convenient for our readers to compare what was asked and hoped for by the manufacturers and the users themselves with what has been actually granted by this order, and for this purpose we have put in comparison, in tabular form, the pith of the regulations, with the recommendations which were prepared by a joint committee of the Society of Motor Manufacturers and Traders and the Motor Van and Wagon Users' Association, and were prepared at various meetings which were held at the Automobile Club during the autumn of 1903

and early portion of 1904, at the time that the evidence on behalf of these bodies was arranged for by the Automobile Club.

Recommendations by Motor Van Users' Association.	New Regulations.	Difference.
<i>Tare Weight.</i> Motor wagon, 6 tons.. Trailer, 2 tons...	5 tons. 1½ tons.	1 ton. ½ ton.
<i>Loaded Weight.</i> Tons per axle, 10 ...	8 tons.	2 tons.
<i>Width of Tyres.</i> 3-ft. wheels, 1 cwt. per ½-in., 8 cwt.	7½ cwt.	½ cwt.
<i>Space between Cross Strips.</i> 3-ft. wheel, 1 in. ... 7-ft. wheel, 2½ in. ...	¾ in. on wheel, 10½ in. wide. ¾ in. on 7 in. dia., 7½ in. wide.	¼ in. less. 1½ in. less.
<i>Speed.</i> Tons per axle. Miles. 10 5 8 6 6 8 4 10 3 12	8 miles an hour without trailer, 5 miles with trailer.	
<i>Speed with Elastic Tyres.</i> Tons per axle. Miles. 10 6½ 8 7½ 6 10½ 4 13 3 15½	8 miles an hour. 12 miles an hour.	

"It will be seen that, as regards the tare weight of wagons, the concession in weight has been 1 ton less than was asked for; as regards trailers half a ton less; as regards loaded weight per axle 2 tons less; as regards width of tyre, in proportion to weight carried, half cwt. per half inch width of wheel less. As regards the use of diagonal strips, the recommendation in the report and the regulation based thereon is so obscurely worded that it is not easy to follow its meaning, but it appears that the regulation contemplates such a small space between the cross strips that their value for increasing the adhesion when the motor wagon is driven over soft ground is so reduced that the wheels are practically no better for this purpose than smooth wheels.

"As regards speed, the maximum speed when trailers are used is reduced to 5 miles an hour, and without trailers to 8 miles an hour for all axle weights, but when soft tyres are used a slight increase of speed is granted for an axle weight of 8 tons, whereas for lighter vehicles—and this affects omnibuses—the contemplated speeds are reduced to 12 miles an hour.

"Turning to the effects of these alterations on the industry, if we are to believe the evidence of the very skilled designers who were before the committee, the one-ton reduction of tare weight will possibly have very grave results in reducing the durability of the vehicles, and consequently in increasing the cost of their maintenance.

"The reduction of loaded weight per $\frac{1}{2}$ -in. of wheel-tread is immaterial, and probably is a distinct improvement from the point of view of road maintenance.

"The reduction in space between cross strips, particularly in wheels of large diameter, will probably have the effect of seriously handicapping motor wagons, wherever these, during any part of their journey, have to be used on soft or slippery ground. From a somewhat obscurely-worded paragraph at the end of the regulations, and which refers to military wagons, it is evident that the committee have appreciated the necessity of exempting such wagons to some extent from this condition, but the regulation being applicable to all commercial vehicles, will tend to defeat one object which has been contemplated by the War Office, namely, that these regulations should be such as to afford a large supply of commercial vehicles which, in the hands of private users during peace time, are used for commercial purposes, but which in case of war or during military manoeuvres could be taken up for military transport purposes on terms to be arranged by the War Office.

McGowan

Messrs. John I. Thornycroft and Co.'s, Limited, Views:—"To the non-expert, the most important feature of these regulations will, no doubt, appear to be the increase of 2 tons in the permitted weight of the unloaded motor wagon, and he may be led to expect great things in consequence.

"But as a matter of fact, though it is a *legal* increase of 2 tons, the *actual* gain is practically unimportant.

"It must be remembered that the 3-ton tare limit of 1896 was imposed at a time when the requirements of the industry were little understood, and it very quickly became apparent that the limit was an impracticable one, and, consequently, it has never been enforced.

"It is very doubtful if there is a single steam wagon (and most of the 'heavy motor cars' are of this type) now running, and carrying 4 or 5-ton loads, which would tare nearer the old than the new limit.

"On the other hand, there are a great many wagons now in use, without molestation, carrying loads of over 5 tons, and which themselves weigh over 5 tons.

"We are glad to note that the regulations will permit such vehicles, having been registered before September 1st last, to continue running until worn out. Had this not been the case it would have inflicted much hardship upon owners of these expensive machines. We are, however, of opinion that the weight limits are not high enough.

"A steam wagon built sufficiently strong and powerful to satisfactorily carry a load of 5 tons, itself weighs nearly 5 tons.

"Also, in order to secure sufficient adhesion between the driving wheels and the road when light, it is usual to allow between three and four-fifths of the tare weight on the back axle. Now, with a limit of 8 tons per axle, and bearing in mind that the load carried is borne almost entirely on the back axle, this means that the useful load can never exceed 5 tons; therefore, it is difficult to see, without great modification of present designs, how the gross limit of 12 tons can be of any advantage.

"There is a very large demand for vehicles to deal with considerably greater loads than 5 tons, and, as has been said, there are many such wagons now running, but

the regulations, though allowing these to continue running, will not permit of any more being introduced.

"The wheel width provided for is more than enough under most conditions, but no objection can be raised to this, though it will necessitate new wheels on nearly all vehicles now in use.

"The use of cross strips on tyres will be of advantage in preventing spinning of the wheels, but the degree will depend upon the spacing permitted.

"The speed limits are practically the same as before, and are inadequate. A wagon carrying a 5-ton load can quite well travel at 6 or 7 miles an hour on a good road without detriment to itself or the road, and with the increased tyre width there seems no object in reducing the speed beyond what everyone knows is present practice. If this regulation be strictly enforced it will bear very hardly on the users, since the great advantage of motor traction lies in the speed.

"The same, of course, applies to the speed limits for the lighter classes.

"The old regulations were admittedly impracticable, and were consequently not enforced, but the authorities are likely to look to it that the new rules are strictly carried out, and herein lies the whole crux of the matter.

"The most serious article in the new regulations is No. 12, which gives the officer of any Highway Authority power to require the driver to take his wagon, at any time, to a weigh-bridge which may be within half a mile, to ascertain if the wagon infringes the regulations.

"The question arises, who is an officer of a Highway Authority? and, how far will the Highway Authorities be likely to delegate this power? Will the police be permitted to order a vehicle to a weigh-bridge?

"This regulation obviously would place a very dangerous weapon in the hands of the authorities, whoever they may be, and one which might be used with much annoyance and loss of time and money to the owners.

"The regulation may be desirable, but, if included, there should certainly be some provision for compensation, if, in the result, the vehicle were found to be *not* infringing the regulations. Some safeguard of the owners' interests is *absolutely necessary*, but is not provided for in the regulations.

"Perhaps one important result of these regulations will be to foster the introduction of petrol-driven vehicles, since these can be built rather lighter than steam wagons by reason of not requiring a boiler.

"Great improvements have been made in this type of vehicle in the last year or two, and petrol wagons can now be built satisfactorily for heavy loads, though, beyond a certain weight, they are perhaps not quite so economical in running as steam wagons.

"In criticising these regulations, it is only fair to remember that they are in the nature of a compromise between the requirements of the industry on the one hand, and the demands of the road, and other authorities, on the other; and, as such, they cannot perhaps be expected to entirely satisfy either party.

"With reference to Article XII., as illustrating what may happen:—

"A heavy motor car is registered for a rear-axle load of 8 tons—the maximum permitted.

"When registering, it is found that by loading forward on the platform a load of 5 tons can be carried without exceeding the axle-load limit.

"The wagon is then put into service, and instructions given that 5 tons is a safe load, but must not be exceeded.

"Now on some future occasion it may chance, for one of several good reasons, that the major portion of the load is behind the axle; then, though possibly the total net load may be under 5 tons, the weight on the axle will exceed the limit of 8 tons.

"In effect it is the disposition of the load carried, and not the amount of that load, which will determine whether the regulation is infringed or not.

"This introduces such a glorious uncertainty that it is bound to lead to innumerable attempts at legalised highway robbery (£10 a time).

$$W_1 + W_2 = \text{tare.}$$

$$W_2 = 3 \text{ tons.}$$

L_1, L_2, L_3 = weight of load at different centres = 5 tons.

Then axle-load is less than $L_1 + W_2$, is = $L_2 \times W_2$,
is $> L_2 + W_2$.

"As regards the speed regulations, those laid down both for rigid and elastic-tyred wheels are reasonable as regards the heavier vehicles, but we doubt very much whether the restriction of elastic-tyred vehicles under 6 tons to 12 miles an hour will not seriously limit the usefulness of the motor omnibusses which we all hope will soon be largely in use in our streets. Anyone who has studied the working of these vehicles will have noticed how successfully they have succeeded in increasing the average schedule speed on some of our most crowded traffic routes. It is well known that horse-drawn omnibusses, in order to maintain their present schedule speed of about 7 miles an hour, are compelled frequently to run at a speed exceeding 10 miles an hour, and occasionally at speeds exceeding 12 miles, but for motor omnibuses to obtain the moderate increase in schedule time of from 7 up to 10 miles an hour, it will be absolutely necessary that they shall be able to travel for short intervals between times of overtaking vehicles, or where the road is free from traffic, at speeds considerably in excess of 12 miles, and we feel sure that on this point the Chief Commissioner of Police will agree with us that limiting the maximum speed of omnibusses to 12 miles will greatly reduce their power of dealing with the present traffic congestion.

"Summarising, it appears that there are three points in which the present and future owners of heavy motor vehicles have fault to find with the regulations. First, in the heavy vehicles, the tare is still insufficient.

Second, that the regulations as to the spacing of cross strips is likely to seriously interfere with the use of wagons by market gardeners, owners of brickfields, timber merchants, and others who have to take their wagons into places where the ground is soft and slippery; and thirdly, as to speed regulation, the maximum speed allowed for motor omnibuses is wholly insufficient to enable them to work with the best efficiency under modern traffic conditions.

"Although it is of the utmost importance that the wording of these regulations should be simple, so as to be clearly understood, we regret to find that throughout the reverse is the case. We need only call attention to the Article VI., page 6, third paragraph, which we quote in full as an instance of how a regulation should not be drafted:—

"Provided also that if the tyre is constructed of separate plates, the plates may be separated by parallel spaces, which shall be disposed throughout the outer surface of the tyre so that nowhere shall the aggregate extent of the space or spaces in the course of a straight line drawn horizontally across the circumference of the wheel exceed one-eighth part of the width of the tyre!"

Mr. T. Clarkson's (of Messrs. Clarkson, Limited) Opinion.—"Respecting the new regulations of the Local Government Board for heavy traffic, the feature with which my firm is more particularly interested pertains to the motor omnibuses and public service cars.

"The effect of the regulations upon this class of motor traffic is, in the first place, to make it absolutely essential to use rubber tyres. This should be a very substantial advantage in reducing the noise in the streets of great cities. Although the regulations do not expressly state that rubber tyres must be employed for this service, a speed limit of 12 m.p.h. is only permissible by the use of rubber tyres, and anything less than 12 m.p.h. would be a serious handicap to this class of traffic.

"For country passenger services I think 15 m.p.h. quite reasonable, and would have preferred this.

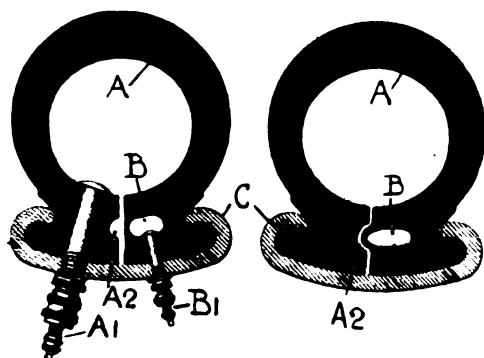
"In other respects I think the regulations are a decided improvement upon those previously in force."

T. Clarkson

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The "Tolson-Holmes" Tubeless Pneumatic Tyre.

—Another tubeless tyre has just been placed on the market, the peculiarity of which consists in the use of a supplementary air-chamber, introduced around inside the foot of the tyre, for rendering the outer cover air-tight.



The above illustration shows two sections of the tyre, that on the left with the joint open and that on the right with the joint closed. The outer

cover, A, is made with a very thick base, in one half of which is a groove, A², and in the other half is formed a rubber-lined air-tube, B. The valves for inflating the tyre, A, and the sealing tube, B, are indicated by the letters A¹ and B¹ respectively. When inflated, the tube, B, expands so as to fill the groove, A², and while the tongue and groove joint thus formed keeps the tyre air-tight, the air-pressure forces the bead well into the rim and enables security bolts to be dispensed with.

Blackheath A.C.—The first annual subscription dance of this club will take place on January 28th at the Concert Hall, Blackheath. A special committee has been appointed to ensure success for this social gathering, and full particulars can be obtained by the members and their friends from the hon. secretary, Mr. Albert Roberts, Madgelands, Beaconsfield Road, Blackheath, S.E.

A New Detachable Non-Skidding Band.—The accompanying photograph represents the latest form of non-skid device, this having been put on the market by the Wilton-Cox Device Co., whose internal puncture-proof band is already well known. The band, it will be seen, is not continuous round the tread, being divided into twelve lengths which are joined together by the straps which are used for fastening it in place. The band is of leather, and is studded with numerous mild steel rivets, the construction being such that the inside ends of the rivets



never come into contact with the tyre so as to chafe it. We understand from Mr. Cox, who sent us the above photograph, that the band had completed 2,000 miles on Mr. C. Lowe's 12-h.p. Wolseley car, which weighs 23 cwt. unloaded. Those interested will be able to inspect the device at the Birmingham Show, by which time the particular band illustrated will have, in all probability, completed another 2,000 miles. Of course, one of the strong points claimed for this construction is the ease with which any particular section can be renewed, should it become prematurely worn out, while an additional advantage is that a pair of these bands, it is said, weigh only 34 lbs.



In several directions we have personally heard of the satisfactory performances of Palmer tyres under very trying circumstances, and we are therefore not in any way surprised to receive from the Palmer Tyre, Limited, the following testimonial from a user of these cord tyres, who has deemed his experience worthy of note in justice to the Palmer Tyre Company:—

"I use a 16-h.p. car, covering on an average 500 miles per week, through all sorts of weather and over all kinds of roads. After various experiences with many different kinds of pneumatic tyres, I had almost decided to fit solids, but instead I fitted a pair of Palmer cord ribbed tyres on the driving wheels, and they have given unprecedented satisfaction. They have covered 11,000 miles, only puncturing three times, and will stand good for a few thousand miles yet before being re-treaded."

AUTOMOBILE CLUB FIXTURES FOR 1905.

A LIST is published by the Automobile Club of the provisional dates for the leading events of the present year, either controlled entirely or mainly by the club. A busy season may from this be anticipated. In July the series of events, in addition to being of practical value, should afford a round of unique holiday outings at a time of the year when the benefit of open-air competitions in the country is most appreciated. May 30th has been fixed for the Gordon-Bennett Eliminating Trials, and the Tourist Trophy will be competed for near the middle of September, both these, as already announced, taking place in the Isle of Man. The following is the list of fixtures:—

Provisional Programme for 1905.

Motor Lamps Trial	...	Feb.
Quarterly 100 Miles Trials...	...	Feb. 10 or 17.
Annual Dinner	...	Feb. 15.
Annual General Meeting	...	Mar. 8.
Light Auto Cycle Trials, 1,000 Miles	...	April 3 to 8.
Light Van Trials	...	April 26 to May 31.
May Day Parade	...	April 29 or May 1.
Auto Cycle Club (Hill Climb)	...	May 6.
Scottish A.C. Reliability Trials	...	May.
Quarterly 100 Miles Trials...	...	May 12 or 19.
Motor Cycle International Cup Race	...	May 15 or 31.
Eliminating Trials (Gordon-Bennett)	...	May 30.
Auto Cycle Trials	...	May 31.
Hill Climb (South Harting Hill)—members A.C.G.B.I. only	...	June 10.
Gordon-Bennett Race	...	June 27 or 30.
Auto Cycle Club Consumption Trial for "Car Magazine" Trophy	...	July 8.
Hill Climb ("Henry Edmunds Trophy")...	...	July 13.
Motor Boat Race (Calais-London)	...	July 15.
Speed Trials (Brighton)	...	July 19.
Motor Boat Trials (Southampton)...	...	July 24 to 28.
Quarterly 100 Miles Trials	...	Aug. 11 or 18.
Auto Cycle Club 1,000 Miles Reliability Trial	...	Aug. 14 to 19.
British International Motor Boat Race	...	Sept. 5 or 15.
Auto Cycle Club Race Meeting	...	Sept. 12.
Tourist Trophy (Isle of Man)	...	Sept. 14.
Daily Graphic Cup (Isle of Man)...	...	Sept. 15.
Reliability Trials	...	Sept. 18 to Oct. 3.
Speed Trials	...	Oct. 4.
Quarterly 100 Miles Trials..	...	Nov. 10 or 17.



Olympia Exhibition.—Arrangements have been made in connection with the forthcoming Motor Car Exhibition at Olympia so that exhibitors will be able to give intending purchasers trials of their cars. A large garage capable of holding over a hundred cars has been erected on the Hammersmith side of the building, and there is also outside standing room for 300 more cars for visitors. The trial cars can easily be run from the Exhibition over Hammersmith Bridge into Richmond Park, where a steep test hill is available to demonstrate the hill-climbing capabilities of the vehicles.

RACES, RECORDS, AND TRIALS.



ORMOND-DAYTONA BEACH RACES.—The Club House at Ormond Beach, which has played such a conspicuous part in connection with the annual races held there, is a prominent feature of the seashore. All the year round it is made a point for the gathering of a large number of automobilists, and in our photograph a group of visitors on their cars is seen in front of this picturesque building, which stands on a bluff overlooking the sea.

Brighton Motor Races, July 19th.—Last week we announced that arrangements for a big motor meeting at Brighton had been concluded, and by our photographs were able to convey some idea of the advantages attaching to the splendid road on the front in regard to providing practically unlimited accommodation for thousands of the public to witness the various events under the best conditions. We are now able to announce July 19th as having been selected for the date of these trials, and the occasion will be made one for introducing several novelties in connection with the programme, likely to give increased popularity to the races both with the public and car owners.

5,000 Miles Reliability Trial.—The running of the 12-h.p. Siddeley car during the first week's test under the official observation of the Automobile Club has been an unqualified success, and each day's journey during this, the second week, up to the time of going to press, has been equally satisfactory. In our last issue, we gave the official results of the first two days' runs. Continuing these up to Saturday last, the total distance covered was 1,000 miles.

Wednesday, January 4th.—Great North Road. No involuntary stops. Distance 166 miles. Total distance 516 miles. Buffers on back springs adjusted in motor house in evening.

Thursday, January 5th.—Banbury Road. The driving wheels slipped on the grease on Sunrising Hill, and passengers dismounted. Distance 168½ miles. Brakes and chains adjusted in motor house, and new spring fitted on air valve on carburettor.

Friday, January 6th.—Bath Road. No involuntary stops. Distance 157 miles. Puncture 61 miles out on near side driving wheel. At the end of the day new cover was fitted on near side driving wheel, the cover having run for 841½ miles. The off side driving wheel tyre has now run 263 miles and 578½ miles without trouble, a total distance of 841½ miles.

Saturday, January 7th.—Exeter Road. No involuntary stops. Distance 158½ miles. Total distance 1,000 miles.

The weather during the week was all against motoring. On Monday a snowstorm was encountered, which was followed by sleet and cold rain. The roads were terribly heavy throughout, and Saturday was the first day on which the conditions were at all agreeable, though the surfaces were still treacherous.

Monday, January 9th.—Coventry road. No involuntary stops. Distance 185 miles. New accumulator fitted. Nut in terminal and starting handle tightened.

Tuesday, January 10th.—Bath road. No involuntary stops. Distance 149 miles. (Total distance 1,334 miles to date.)

2,000 Miles Commercial Vehicle Trial.—The first long-distance reliability trial for a heavy petrol vehicle, conducted under the auspices of the Automobile Club, commenced on Thursday of this week with one of the 24-h.p. Straker-Squire vehicles, of which we give a fully illustrated description elsewhere this week. The chassis, although fitted with a trial body only, is to be loaded to a total weight of about 5 tons, which represents the weight that it would be if completed with a double-decked omnibus body capable of accommodating 34 passengers, but actually carrying about 26 persons. The vehicle is to run a distance of 100 miles a day for twenty consecutive days (Sundays excepted), and will thus cover a total distance of 2,000 miles in a little over three weeks. The load to be carried represents something in excess of the average load which it would be called upon to take if running as an omnibus in London, and it will thus be recognised that the trial is an exceptionally severe one that should prove beyond question the reliability and durability of this type of car, if it successfully survives the ordeal. It is fitted with "Sirdar" solid rubber tyres, a pair of twin tyres being fitted on the driving wheels. Mr. R. W. Sprague is to be the club's official observer.



DELHI-BOMBAY TRIAL.—The Indian Potentates who encouraged automobilism by presenting valuable prizes.

WE have received from the Motor Union of Western India the admirably executed and illustrated programme of the great Reliability Trial from Delhi to Bombay. A feature of the programme is the excellent map of the course, which is as clear as crystal from start to finish, and so detailed that even the most determined booby could hardly lose his way. It is interesting to notice the large number of English firms which have utilised the opportunity to advertise in the pages of this publication. It is from the official programme that we have taken the portraits of the four Maharajahs who have generously contributed the principal prizes for the competition. The programme also contains portraits of Lord Curzon and Lord Kitchener.

Ormond-Daytona Beach Races.—During the last week of this month a great meeting of automobiles will again be held on this magnificent American sea beach. We have already given the features of this season's programme, and we have now received from a correspondent in Florida some interesting particulars of the beach, the growth of the meeting, and the preparations which have been in progress to meet the increasing popularity of the annual fixture. From these we learn that the condition of the Ormond-Daytona beach this winter is magnificent; according to old residents it was never better. It is entirely different in formation from the northern beaches, or in fact any other beach in the world, and this has been the cause of its great reputation.

Its sand is composed largely of the shells of the

coquina clam, peculiar to this part of Florida. This shell is about one-half an inch long and very thin. For ages Nature has been rolling them up, washing them back into the surf and pulverising them. Examined under a microscope each particle is round, unfit for mortar, builders say, because its smoothness prevents it from holding together; yet strange to contemplate, the very moment a wave leaves the wet, apparently soft beach, these round particles settle down into a kind of cement almost as hard as asphalt, which is beyond the comprehension of one who has not seen it. It might almost have been made for the automobile for, regardless of weather conditions, there is no mud and no dust. Here too the great dangers of road and track racing are entirely eliminated. Repairs are unnecessary as twice each twenty-four hours it is entirely rebuilt by the tides. Immense holes may be dug but the next tide hides every trace of them.

Being almost level, and with an average rise and fall of only 2 feet 9 inches between high and low tide, this beach is from 300 to 500 feet wide, and can be used from two hours after until two hours before high tide, thus giving an average of seven to eight hours for motor-ing each day.

Mr. J. F. Hathaway, the veteran automobilist—called by his familiars the father of the Florida beach racing—suggested and organised the Florida East Coast Automobile Association, under whose auspices the Ormond-Daytona Beach Tournaments have developed into such prominence. In 1900 he brought one of the first motor cars ever seen in Florida, and had many queer experiences with the native "crackers," who at that time were very much opposed to these "new fangled machines." One, whose horse he had frightened, called his automobile a "hell cart," and threatened to shoot him if he did not get it out of town in a hurry. Then followed the developments. This man still resides there, and now runs a motor car himself, at least tries to run one. Recently, being on the beach, something went wrong with the reversing gear, and the car backed into the ocean, where it remained until his old reliable white horse, called "Rock of Ages," pulled it out.

Great changes have taken place at Ormond during the past five years, and there are more automobiles in Daytona now than in any other town of its population in the world.

During the past summer the Florida East Coast Automobile Association has erected a most attractive and commodious club house on the beach, directly opposite the half-way post of the 20-mile course. The club has a membership of 200, and among them many prominent and well-known people—W. K. Vanderbilt, jun., H. M. Flegler, Howard Gould, John Jacob Astor, and many others.

Daytona has erected two new hotels, and nearly all of the twenty others have made extensive improvements. At Ormond 300 men have been busy on the addition to the great hotel and a new railroad bridge across the Halifax river, so that passenger trains can run to the very portals of the hotel. A large garage has been erected with all modern conveniences, and a chauffeur's club house, with a comfortable club room and thirty sleeping rooms. At the hotel on the beach substantial additions and improvements have been made in preparation for the rush of the races. First-class hotel accommodation will also be found at St. Augustine's palatial hotels, from which the railroad company will run excursions to Ormond and Daytona during the race meet.

Glidden Tourist Trophy.—July 11th has been fixed for the first contest for this trophy to commence. The tour will take the place of the annual Endurance Run of the American Automobile Association, and will start from New York City. It will last for two weeks over a route of 1,000 miles, the chief cities visited being Stamford, Bridgeport, Newhaven, Hartford, Springfield, Worcester, and Boston. A run round Boston will be made of about 100 miles, occupying one day. The cars will then travel to the White Mountains, returning to New York City *via* Lowell, Worcester, Lenox, Albany, and Poughkeepsie. Two days will be spent in the White Mountains and one in the Berkshires. The chief points governing the trophy have already been given by us, and the contest is to be decided on stops for repairs and fuel consumption, the latter being worked out on the ton mile basis. Points will be deducted for all stops, except for tyre troubles.

Automobile Meeting at Royan.—An important automobile meeting is announced to be held in September next from the 3rd to the 10th, primarily under the organisation of the *Paris Figaro*. Not only will there be motor car races on the front and on the sea-shore, but provision is also to be made for a 200 kilometre motor boat race between Royan and Bordeaux, whilst balloon contests will also form part of the meeting. The speed races will be run in heats and finals over the mile and kilometre each day for various classes, the principal cups offered being awarded to the car making the best combined times for the mile and kilometre.



BRIGHTON MOTOR RACES.—Last week we published some photographs, unfortunately secured under very wet and misty conditions, giving an idea of the terraces available for these races. In the above picture the extent of the "straight" is seen, Duke's Mount being just discernible in the distance.

Cannes Automobile Meeting.—February 11th to 25th has been fixed for holding this fixture, when the principal items in the programme will be a gymkhana and fête, a tourist car competition in two stages, a fuel consumption contest, a paper chase, and an "appearance" competition, whilst a battle of flowers will take place on February 22nd.

Nice Week.—The speed mile and kilometre at this meeting will not be held this year on the Promenade des Anglais, but will, it is announced, take place on the National Road near Antibes. The meeting will commence on April 14th and 15th with a tourist car trial, the mile and kilometre will be on the 17th, the Coupé de Caters on the 18th, and the Coupé Provinciale on the 23rd.



MOTOR BOATING.

Rating Formulæ for Motor Boats.—It is evident from the letters we receive from our numerous correspondents, that many of those taking an interest in motor boating are unaware of the meaning of "M.P." when used to denote the power of the engines in petrol launches. Although we deal with this question in a special leading article, this week, the following explanation may be found useful. The "M.P.", which denotes "motor power," is calculated by an empirical formula introduced by the Marine Motor Association, and is rather a *measurement* of the engine than an expression of actual horse power. The "M.P." is calculated from the bore and stroke of the cylinders, taken in conjunction with the normal engine speed, and the formula used is as follows:—

$$\text{M.P.} = \frac{A \times S \times R}{C}$$

in which A = the total piston area in square inches, S = the stroke in feet, and R = the revs. per min.

The divisor, C, is a constant which differs according as to whether the engine works on the 4-stroke (Otto) cycle or on the 2-stroke cycle, being taken at a value of 1,000 in the former case and 600 in the latter case. To take a couple of instances: The "M.P." of a single-cylinder 2-stroke engine, having a 5-inch bore, a 6-inch stroke, and a normal speed of 400 revs. per min., would

be 19.635 (the area of the 5-inch piston) multiplied by $\frac{1}{2}$ (the 6-inch stroke, in feet) multiplied by 400 (revs. per min.) divided by 600 (the constant for 2-stroke motors), and this gives 6.5 as the "M.P.". Similarly, the "M.P." of a 4-stroke, 4-cylinder engine, having a bore of 4 inches, a stroke of $4\frac{3}{8}$ inches, and a normal speed of 1,000 revs. per min., would be four times 12.5664 (the total area of the four pistons) multiplied by $\frac{4\frac{3}{8}}{12}$ (the stroke in feet), multiplied by 1,000 (speed), and divided by 1,000 (the constant for such an engine); this gives 18.3 as the "M.P." It will thus be seen that the "M.P." of a petrol engine does not necessarily bear any precise relationship to the actual brake-horse-power that it is capable of giving, even at normal speed, but that it forms a convenient basis for use in certain boating competitions where no actual measurements of b.h.p. can be obtained officially.

It is interesting in this connection to mention that a suggestion is now under consideration for increasing the value of the constant C, in the above formula, for engines using paraffin instead of petrol. Such very diverse opinions, however, are held concerning the relative power capabilities of engines of the same size, employing these different kinds of fuel, that the M.M.A. will naturally have a good deal of difficulty in fixing a value which will satisfy anything like all their members. The fact of the

matter is that it all depends upon the manner in which paraffin is employed, as to whether the maximum output of a given engine is even higher, or is considerably lower, than when running on petrol in the usual way.

Quite recently the rating rule adopted by the M.M.A. for the boats themselves has been altered in such a way as to favour boats of moderate power when competing against purely racing boats.

The formula as now adopted is as follows:—

$$\text{Rating} = \frac{P^2}{A} + \sqrt{L}$$

in which P = the "M P" referred to above, A = the area of immersed midship cross-section in square feet, and L = the overall length in feet.

Hitherto, the rating was arrived at simply by multiplying the length and the power together, and then dividing these by the immersed cross-section, but it has been obvious, from the results of the past season's racing, that the length of the boat has relatively little bearing upon the speed as compared with the effect produced by increased power. Now, as will be seen, higher engine powers increase the rating very greatly, while greater length has considerably less effect upon it than before.

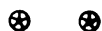
Curiously opposed to this, is the even more recent action of the first International Motor Boating Congress, held in Paris, the delegates having passed the following formula for cruisers, viz.:—Rating : Displacement. Length × R

This rule is to come into force in 1906, when it will govern all International Motor Boat Races taking place in that and following year. Racing boats are, as we reported in our issue of December 24th, to be classified solely by length.

We notice, too, that the A.C.F. and the Y.C.F. have now adopted a formula for determining the "length" of a boat. This formula is as follows:— $L = \frac{L^1 + L^2}{2}$,

where L is the "length" for the purposes of rating, L¹ the length of hull between perpendiculars, and L² the length on the water line. Hitherto only the length of hull has been considered, but, under the new rule, boats having an overhung bow or stern will be able to take advantage of their short water line and enter in a lower class, so far as "length" affects the question.

Monaco Motor Boat Meeting.—Upon the final examination of the lists of entries it has been found that a total of 104 boats has been received, viz., 89 French craft and 15 foreign. The popularity of various builders of this class of craft in France may be gauged by analysing the constructors of the boats. Pitre and Co. are at the head with a total of 23 (9 racers); La Marguerite with 9 (6 racers); Tellier and Gerard, 8 (6 racers); Chantiers, 8 (all cruisers); whilst the majority of the others have 1, 2, and 3 each only to their credit.



Crystal Palace Automobile Show.—This Exhibition opens at the Crystal Palace on the 27th inst., closing on February 4th. We learn from Mr. F. W. Bailey, the manager, that amongst the various cars shown will be found Hotchkiss, Mercedes, F.I.A.T., Panhard, Clement, Darracqs, Renaults, &c. In the heavy vehicle section Messrs. Jesse Ellis, Thames Engineering Company, and Wallace and Stevens, will have

Recopé Cup.—The date for challenges for this cup, for motor boats using heavy oil as fuel, expired on December 31st. M. Cazes is the present holder and the only challenge received is from MM. Gautreau, of Dourdan. In all probability the contest for the cup will take place on September 11th, in the Arcachon Basin, on the same day as the race for the British International Cup.

Mediterranean Cup.—It is anticipated that about a dozen competitors will actually take part in this race from Algiers to Toulon, to be held as soon as possible after the Monaco Motor Boat Meeting. It is not proposed to publish a list of those who have undertaken to participate, as the organisers believe that the larger number of these have no real intention of ultimately competing, and only desire to obtain wide advertisement, to which they are not justly entitled. Therefore, only the final list will be issued, in which the actual likely competitors' names will be included. Considerable official notice is being taken of the race, Italy having promised to send some torpedo destroyers to accompany the boats, the French Minister of Marine also being represented by similar craft, whilst it is reported that both England and Spain are arranging for some fast boats of each nation to take note of the performances of the different boats engaged. About 50,000 francs in prizes will be distributed, and it is broadly hinted that when the results of the race are known a substantial order from the French Minister of Marine is likely to follow for boats of a similar type to the winning craft.

A PASSENGER service of motor boats has been officially authorised to be established within the port of Buenos Ayres.

A MOTOR boat race is being organised by the A.C. Bordelais, over a distance of 298 kiloms., in Gironde, Gascogne, and Dordogne.

THE Cannes authorities have decided to hold, this year, a motor boat meeting on April 20th and 21st, when the Alexander Burton Cup will be included in the programme.

THOSE interested in motor boating, and desirous of placing their orders so as to ensure delivery for next season, will do well to procure for themselves a copy of Messrs. Brooke and Co.'s new catalogue. No less than seven different stock sizes are kept, ranging from 4-h.p. to 150-h.p., so that this firm may well be said to cater for all classes. Their latest production, it will be remembered, was described by us recently, and a reprint of our description of this cheap and useful little craft accompanies the catalogue.



exhibits. Racing cars are also to be in evidence, and the testing of cars by trial runs in the magnificent Crystal Palace grounds will be a feature of the Show. Demonstrations will be held in the grounds of various non-slipping devices. The accessory section will be shown on the ground floor. Messrs. Dunhill are arranging a big display of practically every accessory that the most exacting motorist can require.

CORRESPONDENCE.

* * *The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.*

1905 "IMPROVEMENTS."

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I have read with interest Messrs. Panhard and Levassor's letter in your issue of December 24th, and whilst I quite appreciate that as a great French firm they naturally do not wish to admit that they copy the Napier in any particular, their letter is hardly a reply to the statement made in my letter of November 28th, which clearly pointed out that France was copying England. These points were set out perfectly simply and clearly, and I cannot see anything in Messrs. Panhard and Levassor's letter that should make me withdraw one single word.

I am pleased to hear that Messrs. Panhard and Levassor had the live axle in use in their works ten years ago; this being the case, all the more credit to Mr. Napier, who, in 1902, applied the system of the live axle to a powerful car, and thus proved to Messrs. Panhard and Levassor that the system with which they were familiar could be applied to racing cars without difficulty, and now, in 1904, they have found out that what Mr. Napier found correct in 1902 is correct to-day. It is obvious if they had been familiar with the live axle, they would have used it long ago if they had been able to manufacture it for high-powered vehicles.

Yours truly,
S. F. EDGE.

December 28th.

WANT OF COURTESY OR ———?

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—When returning from Gravesend to London on the night of Sunday, November 27th last, we found a two-seater car hung up, and, on offering assistance, the driver asked if we could lend him a sparking plug; we accordingly pulled up, and, after testing the ignition, lent him a new E.I.C., which immediately rectified the trouble; so, after giving him my card, we proceeded on our journey, since when we have heard nothing from him.

I trust you will favour me by inserting this letter, as I feel sure that the card has been mislaid, and that on learning my address (11, Therapia Road, Honor Oak) the gentleman will return my property, as, although the cost in this case is small, one does not wish to make a practice of distributing spares.

Yours faithfully,
F. DENNISON TAYLOR.

December 30th.

A STEAM CAR CLUB.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I think the following may be of interest to some of your readers, more especially those who are owners of steam cars of the various types, such as the Milwaukee, Locomobile, Toledo, Weston, etc., etc., and I should, therefore, be obliged if you can see your way clear to insert this letter.

As far as I know, there does not appear to be any club or association which appeals directly to the above description of car, and it has been suggested that a steam car club or association might be formed. With this object in view, I shall be very pleased to hear from any of your readers who may be interested in this project, and I should be glad to be instrumental in doing all in my power to make this a success.

There are countless reasons for the usefulness of the above, and to mention only a few:—

To arrange meets and runs for steam cars.

To assist members in obtaining parts, accessories, etc., and to secure advantageous terms for members.

To issue from time to time a report of various improvements which have been carried out on members' cars, and the effect of same.

There cannot be the slightest doubt that such an association would be an immense boon, while the status of the types of car in question would be immensely improved.

I shall be obliged if your readers will kindly bring this matter before anyone likely to be interested; and, if desired, on names and addresses being furnished, I will write direct.

Yours faithfully,
T. MURPHY.

135, Cloudesley Road, N.
Dec. 29th, 1904.

SUNRISING HILL CLIMB.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Owing to the holidays we did not see your footnote to our letter on the above subject in time to deal with it in your last issue. We thank you for the information given and for your concurrence with the reasonableness of our views, but would ask you to permit us to point out to the Secretary that to take 1,000 ft. per min. piston-speed as a constant factor is not one whit better than taking 1,000 revs. per min. It is equally unfair to the slow running engines. Take our own case, for instance; to get 1,000 ft. of piston-speed per min. we should require to run our engines at the rate of 1,333 revs. per min., and, as we pointed out in our last letter, with an engine doing its best at from 600 to 800 and not calculated to exceed 1,000 revs. per min., such a factor is altogether unfair to not only the Duryea but to all other cars with slow running engines, and plays right into the hands of the high-speed division. When we said that we could have understood it if piston-speed had been taken instead of revs. per min., we were certainly not suggesting a uniform piston-speed for all cars, which is equally absurd with uniform revs. per min. What we suggested was that the actual piston-speed should be taken, and we may say that—as we were given to understand, prior to the contest, that "horse-power as shown by performance" was proposed to be taken as a factor, and as such a factor would have caused an efficient transmission to be put in the scales against and not in favour of a competitor—we wrote to the promoters and gave them the particulars of our engine, and further than this, asked them to make a visit of inspection and actually test the correctness of the information given, either in our own works or in those of Messrs. Willans and Robinson, Limited (the manufacturers of the engines), at any time convenient to them, not giving us any notice whatever, the test to be made upon the engine or engines which happened at the time of the visit to be on the testing bench.

Yours faithfully,
THE DURYEA COMPANY, LTD.

January 2nd.

BOYS AND TAIL-LAMPS.

To the Editor of THE AUTOMOTOR JOURNAL.

DEAR SIR,—Just a line to warn your readers of a trick I saw played the other night. A car was travelling slowly through the traffic, and after it had passed me a few hundred yards I saw some boys run up behind it and blow out the lamp. I unfortunately could not stop to warn the driver, and I hope he met a lenient policeman, but it would be a serious matter if this trick were not put a stop to.

Yours truly,
J. M. MACLULICH.

January 5th.

DELHI-BOMBAY TRIALS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Referring to the letter received by you from Mr. Edge in regard to the Delhi-Bombay motor trials, I think this is very inclined to mislead. In the first place the Delhi-Bombay Competition is not a race. Lord Curzon, in giving permission for the trials, distinctly stated that racing under no circumstances would be allowed. It is a reliability trial pure and simple, and, therefore, for Mr. Edge to suggest that the car in which he is interested finishing first is a success for the British industry is misleading to the last degree.

The information would be of greater value if Mr. Edge had waited till the competitions were finished before publishing any results.

Yours faithfully,
CHAS. JARROTT.

January 2nd.

EXHIBITION DATES.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I think it would be of interest if you called for the opinion of the leading British motor firms as to the advisability of the English Motor Show being held in November, 1905, instead of being carried over to January-February, 1906. I feel certain it would be to the interest of everyone, both manufacturers and buyers, that the coming season's models should be shown each year not later than November. This gives customers time to make up their minds to settle what they will buy, and enables the manufacturers to be well forward with their work.

I may say that if the trade societies elect to continue to play into

the hands of the foreigners by holding their shows in this country in the spring instead of in November of each year, my own firm, and as many of my friends as I can influence, will support a show that will be held about November, 1905.

January 5th.

Yours truly,
S. F. EDGE.

THE CARE (?) OF MOTOR OMNIBUS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Having occasion to often visit a large town in the Midlands, and being interested in the motor industry, I cannot help noticing the depreciation, apparently through neglect, of a line of motor omnibuses running there.

Now under the favourable conditions this line is running, viz.: no steep grades, wood paved streets, and exceedingly well patronised, this line ought to render a substantial dividend to those interested.

About six months ago, when I first saw these 'buses, they were

running beautifully; quiet, smooth running, and well master of their work.

In December, when I last saw them, one would scarcely believe they were the same vehicles, engines knocking, gears noisy, and generally in a disgraceful condition, fully bearing out the statement of one of the drivers with whom I entered into conversation, that they had not been off the road for repairs since they were new.

Now in the first instance, these well designed vehicles were admirably adapted to their work, and would, with reasonable attention, have been a splendid investment, but under their present conditions I feel sure they will bring loss to those interested, and what is more, in my eyes, do considerable damage to the trade in general.

This new and important branch of the industry, has, I think you will agree with me, an immense future, if only the various companies concerned can be brought to realise that it is absolutely necessary to hold in reserve vehicles to about 25 per cent., to insure proper and reasonable repairs.

EDWARD F. BAKER.

Coventry, January 9th.



SIX YEARS OF FRENCH AUTOMOBILE EXPORTS—AND ENGLAND.

TABLE OF FRENCH AUTOMOBILE EXPORTS FROM 1898 TO 1903.

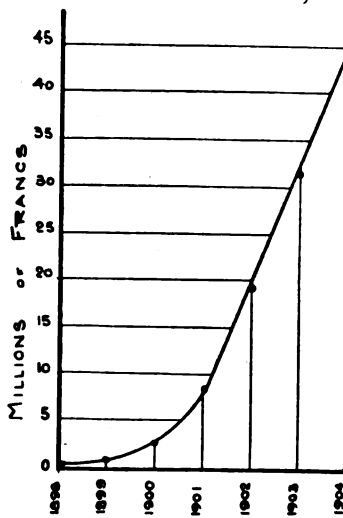
Country.	1898.	1899.	1900.	1901.	1902.	1903.
	Francs.	Francs.	Francs.	Francs.	Francs.	Francs.
England	569,070	910,520	2,529,520	8,312,880	19,189,930	31,677,100
Germany	—	482,290	1,003,910	1,163,360	1,859,420	5,391,970
Belgium	201,710	484,660	573,530	1,161,600	2,043,820	3,678,630
Spain	—	464,810	2,567,160	—	—	—
Italy	103,730	—	727,480	1,459,130	2,417,160	2,363,370
Other Countries	283,240	730,490	1,261,960	2,179,890	2,941,870	5,282,460
Algeria	481,170	166,710	325,530	846,120	1,135,180	1,818,670
Colonies	110,430	1,019,850	598,270	659,310	632,000	624,940
Total Exportation	1,749,350	4,259,330	6,617,360	15,782,290	30,219,380	50,837,140
Percentage of Total sent to England	31 %	47 %	26 %	52 %	63 %	62 %
Cars built and sold in France	1,850	1,900	5,000	8,800	16,500	19,500
Value of above Cars	8,300,000	9,500,000	27,500,000	53,000,000	99,000,000	136,000,000
Percentage value—represented by exports sent to England—of the Cars sold in France	6.8 %	9.6 %	9.2 %	15.6 %	19.4 %	23.2 %
English imports (official)	(Not shown separately)	prior to 1902	—	—	27,500,000	49,600,000
Percentage value of imports from France	—	—	—	—	70 %	64 %

If there be anyone who still doubts that the motor car industry is one worthy of serious consideration from a financial standpoint, or that the French trade is a big one, a careful perusal of the statistics tabulated below should, at least, prove convincing that the French, at least, can show material financial benefits from their enthusiastic support of the automobile.

How England has helped the French motor car industry to grow is graphically shown by a glance at the accompanying diagram, which has been constructed from the tabulated statistics. The extraordinary rise in the value of the exports sent to England alone after the year 1900 is nothing short of phenomenal. The economic aspect of the present situation has been dealt with by us in the front part of our present issue, and the seriousness, politically, of allowing France to supply us with what we can very well make ourselves, and which is at the best largely made with our own raw materials, is there explained.

In the above table the value of the cars constructed in France, as estimated by Mons. Max Richard, President of the Chambre Syndicale de l'Automobile, will be seen to have increased enormously during the six years

which are there tabulated; of course the average value



The Growth of the French Industry.

assigned to each car varies, too, from year to year. Thus in 1898 the average value taken was £180, an additional £20 per annum was put on the average value until 1901, the years 1901 and 1902 are assumed to have the same average value for cars, while for 1903 the average value given was £280.

In 1904 France made 22,000 cars, which at an average value of 8,000 francs (£320) gives a total value of 176,000,000 francs (£7,000,000).

Prior to 1902 motor cars did not figure separately in the English returns as imports. Commencing with that year the values of the imports of motor cars, motor cycles and parts were for 1902, 1903 and 1904, respectively, £1,103,065, £1,988,553 and £2,471,667, of which 70 per cent., 64 per cent., and 73 per cent. came from France each year. No English exports of automobiles were shown separately prior to 1904, during which

year £360,377 was the value of the goods sent out of this country. France during the same year exported altogether 76 million francs' worth of goods (£3,040,000), so that the English exports are hardly 12 per cent. of those of France. It is interesting to note that of the cars imported into this country only £57,875 in 1902, and £142,908 in 1903 were re-exported from England, so that the majority of the imports stay in the country.



Automobile and Cycle Engineers' Institute.—The third ordinary meeting of the present session of this Institute will be held on January 19th, at the Acorn Hotel, Temple Street, Birmingham, when the chair will be taken at 7 p.m. by the President of the Institute, Mr. H. Austin. The meeting will be devoted to the inspection and discussion of:—Four-cylinder Motor Bicycles (introduced by Charles Binks, Esq., of Nottingham); the Locostyle Electric Plating Machine; Carburettors (introduced by E. W. Walford, Esq., of Coventry); and Various Makes of Silencers.

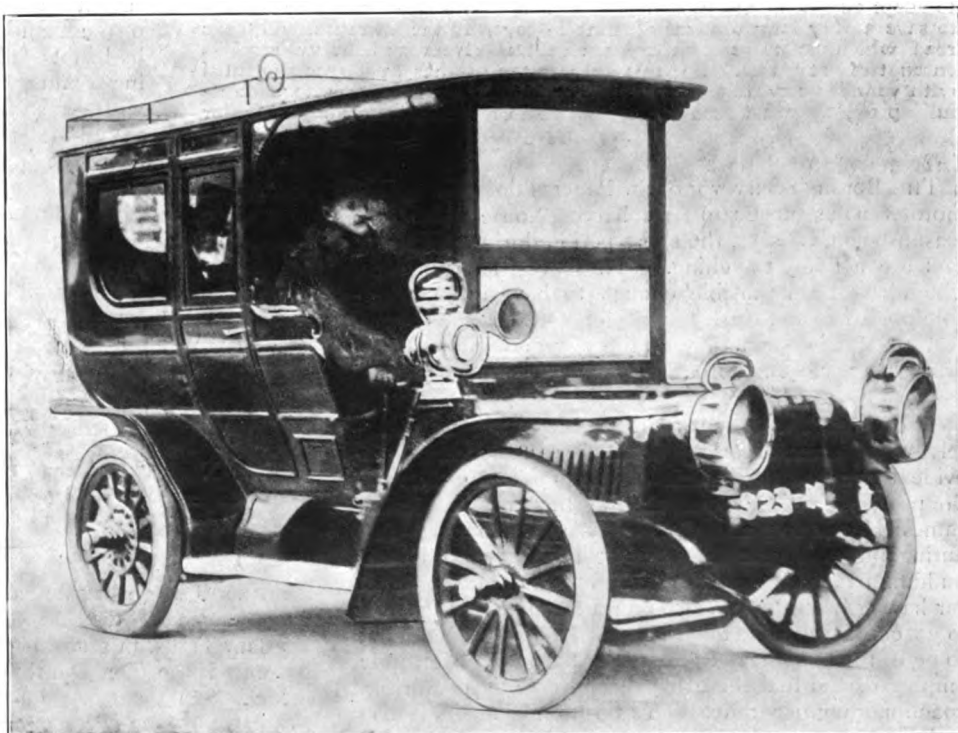
The Motor Volunteer Corps.—We learn that Field-Marshal Earl Roberts, V.C., K.G., K.P., G.C.B., O.M., G.C.S.I., G.C.I.E., has consented to be the guest of honour at the annual dinner of the Motor Volunteer Corps, to be held at the Trocadero on Monday, the 13th February next.

During the past few days an important staff ride has been conducted by General the Hon. Sir N. G. Lyttelton, K.C.B., Chief of the General Staff, at Camberley, at which the chief staff officers of the whole of the districts throughout the Kingdom were engaged. The following officers and members of the corps were employed during the duty, 6th to 9th inst.:—Captain L. E. Scarth, Captain H. V. C. Ker-Seymer, Members O. Stanton, Earl Russell, J. T. Overton, E. Sinclair, M. S. Myers, F. J. Frost, G. C. Sherrin, W. H. George, the whole period. Lieuts. H. Welch-Thornton and J. W. Orde, and Member C. Lamb, on the 9th only. Lieut. P. V. Morgan and Member C. Knight, the 6th and 7th only.

A cross-belt to be worn with the full dress by the officers of the corps has been approved by His Majesty the King. The rules of the corps have also been approved by His Majesty

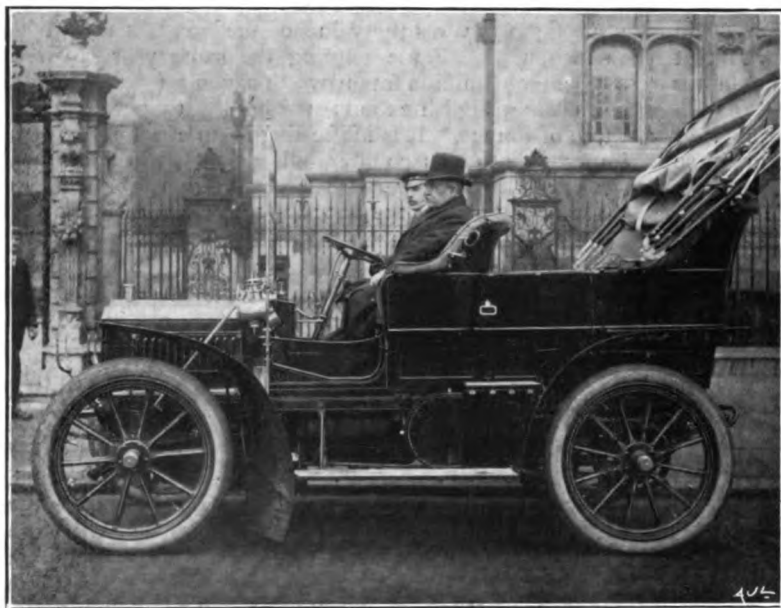
will open the Brussels Automobile Salon to-day, Saturday.

It is often difficult to know where officialism should draw the line between a proper enforcement of the law as it stands and that exaggerated insistence on niceties which usually is designated by the title of "red tape." These reflections are suggested by the case of Mr. F. Mackenzie, whose motor car for children was noticed by us a short time ago. In one form it consisted of a little bassinette electrically driven, so designed as to be controlled by the nurse, who in consequence only made a pretence of pushing it. The baby, therefore, had all the delight of imagining that he was driving a real motor car, and the nurse had the trouble of pushing it taken off her hands. It is now somewhat disappointing to learn that the County Council are of opinion that these toy vehicles will be considered by the police to be motor cars under the Act, and this presumably for the present will put an end to the motor baby-carriage.



Almost historical must be accounted the first ride of President Loubet in an automobile, after performing the opening ceremony at the Paris Automobile Exhibition last month. Before that date nothing would induce M. Loubet to trust himself to this method of travelling. Since his experience, however, there are several signs that he has been partially, if not completely converted, and the influence for good which such a change will probably bring about can hardly be overrated. M. Gabriel, the well-known racing man, was the fortunate driver to give M. Loubet his first drive, the car being a 24-h.p. De Dietrich, which is seen in our photograph above with President Loubet seated in the coupé.

KING LEOPOLD OF BELGIUM, it is officially notified,



Daily railway journeys in London are sufficiently irritating to regular travellers in regard to the time which, as a rule, they occupy. In South Africa, for different reasons, the inconvenience of slow travelling is more acutely felt, and, therefore, the spread of automobilism in Cape Colony is daily on the increase. A recent instance of this is afforded by Mr. A. Ohlsson, one of the well known South African millionaires, who has just had shipped to Cape Town the 24-h.p. Napier car, seen in our photograph, in which Mr. Ohlsson occupies the front seat. Mr. Ohlsson's large estates on the east of Cape Colony are about 230 miles from Cape Town, and the unreliability and slowness of the train service determined him to adopt automobilism, by means of which, it is stated, he is now enabled to save a very large amount of time in covering the distance. On the road which he traverses there are several rivers and heavy sand is encountered at places. For this purpose the car has been specially fitted with very large wheels and a guard placed over the engine, to successfully provide against such obstacles. Ample provision is also made for heavy luggage.

THE Borough Surveyor of St. Pancras does not regard motor vans as successful for collecting house refuse, the reason being, he says, the short period during which the cars are actually travelling. Those vestries, however, which have been sensible enough to have interchangeable bodies so as to use the vehicles for other purposes at night and in the middle of the day, have come to a different conclusion.

THOSE coachbuilders who in good time adapted themselves to manufacturing bodies for motor cars have evidently reaped the benefit of their forethought during the past year. We notice that in this respect Messrs. James Henderson and Co., of Glasgow, report that during the past year their output in motor car coachbuilding has more than trebled, every style and make of car having been turned out in large numbers. In regard to coachbuilding generally, Messrs. Henderson state that some of the branches of the trade have not been fully employed, and that there has been slackness of work in coachbuilding generally. This position of affairs is also endorsed by Messrs. J. Buchanan and Co., of Glasgow, who report that the demand for private carriages in this country has not been extensive this year, while foreign and colonial orders have been scarce and keenly competed for. The motor car industry in their case again has saved the situation, and has enabled them to keep all the departments in their factory working full time.

THE beginning of each season usually brings some interesting motor catalogues to hand, and for so young an industry, some of the finest specimens of catalogue work have been published that have ever been issued in connection with any particular trade. The new catalogue for the Crossley vehicle must be included in this category. Although not very extensive in size, it is unique in its get-up, charmingly printed, and with sufficient information in its pages to convey to likely buyers all they may desire to know in the first instance, prior to diving further into commercial details with a view to acquiring one of these well-finished cars.

A PLEASANT little gathering took place last week at the Florence Restaurant, Rupert Street, when the first annual dinner of the Electromobile Company's Cricket Club was held, Mr. Theodore G. Chambers (the managing director of the company and the treasurer of the cricket club), occupying the chair, assisted by Mr. George Cockerton, the secretary of the company. Fifty members sat down to dinner. Mr. E. J. Wagner, the secretary of the club, reported that during the season they had only lost six out of seventeen matches, and the only regret of the members of the club was that they had not had any opportunity of playing against any other motor company's club—a state of things which he hoped would be remedied next season. An excellent programme of songs, recitations, and instrumental music followed the dinner, this portion of the entertainment being unique, inasmuch as the whole of the talent was supplied by those associated with the company. Mr. Masters officiated at the piano, whilst amongst those who took part in the entertainment were Messrs. Hixson, West, Oakley, Kirkby, Wagner, Hall, Etheridge, Johnson, Gillett, Addison, Saward, Osler and Powell.

THE Nordisk Motor Union has been formed in Copenhagen by the leading firms interested in automobilism in Denmark.

THE A. C. de France have by way of celebrating the performance of the De Dietrich car in the Delhi-Bombay Trials, in securing the Gaikwar of Baroda's Cup, presented the De Dietrich firm with their big silver medal.

A THREE days' Automobile Carnival is announced as likely to take place at Havannah, Cuba, on February 9th, 10th and 11th. It will be under the official auspices of the President, and will include a road race of about 100 miles, and speed races in Havannah, in addition to illuminated and floral parades and auto-boat races in the harbour.

THERE is no doubt that the Emperor of Germany is an authority on uniforms, he having been known to have donned as many as ten different military costumes in the course of a single day; his approval, therefore, of the uniform which has been selected for the Volunteer Motor Corps attached to the German Army amounts to the approbation of an expert. The colour, we are informed, is "what is known generally as khaki," but the shoes and gaiters are *yellow*! After the Emperor's publicly pronounced views on the "yellow peril," this colour scheme is noteworthy.

SOME time ago we commented on the condition of affairs prevailing in Paris and the difficulties which existed in the way of automobilising the 'bus service of the French capital, due to the fact that the omnibus company's contract expires in 1910 and that the Municipality had not then seen their way to renew it. Under the circumstances, of course, the 'bus company would naturally not incur the expense of conversion, but now the Municipality recommend the renewal of their lease when it expires, for a period of thirty years, among the conditions of the concession being that all horsed omnibuses at present running in Paris are to be abolished and replaced by automobile 'buses. In the central Boulevards and other streets which are too narrow or in which traffic is too congested to permit of tramlines being put down, the present lines of 'buses drawn by horses are to be replaced by light motor cars able to run in and out of crowds of vehicles. The existing lines of electric and compressed air tramlines belonging to the omnibus company will remain as at present. This is an excellent and common-sense way out of the existing deadlock, and Parisians presumably will soon have the advantage of what will in all probability be the finest 'bus service in the world. It will be interesting to see whether progress is made more rapidly there or in London.

EVEN distant Dahomey has learned to know the motor bicycle. A young European resident has one of them, and needless to say the excitement he causes in the native villages when he passes through them is extreme. All the inhabitants, it is said, rush out to see the "machine which goes by itself and fires off guns all the time."

THE motor 'bus movement is progressing apace, and that it will be a very paying business for the companies is rendered certain by the patronage extended to the few 'buses that have already been put on the streets. To "motor-bustle," an expression invented by a witty Camberwell gentleman, is becoming a regular term. Said this improver of our language, when asked if he were going by the electric tube, "No, I am in a hurry, and I shall motor-bustle."

A BIG endurance contest for tourist motor bicycles similar to the Bordeaux-Paris run last year, it is officially announced, is again to be organised during the present year by the Auto Cycle Club of France.

COMMERCIAL POINTS.

IN reference to the issue of capital by the London Road Car Company, Limited, mainly for the purpose of introducing motor omnibuses on the road, to which we drew attention last week, we learn from Capt. Theo Masui, agent general for the Germain cars, 1, Hanover Court, Hanover Street, W., that a large number of these omnibuses will consist of the well-known Germain type, these having been selected by the company after subjecting one of the vehicles to a severe trial which proved eminently satisfactory.

MESSRS. CARLESS, CAPEL AND LEONARD advise us that they have further reduced the price of their standard petrol 1d. per gallon.

IN the Delhi-Bombay Reliability Trial there is no doubt many of the cars were victims to tyre troubles to such an extent that the marks so lost placed them outside the early arrivals in the test, and therefore the award list. Amongst those experiencing bad luck in this direction, we learn, was the Thornycroft petrol car which lost no marks whatever except from this cause.

MR. ERNEST H. ARNOTT advises us that he has resigned his position as sales manager with the Simms Manufacturing Company, Limited, and joins from Monday next Messrs. C. S. Rolls and Co., Ltd., as manager of the Minerva department, and of the trade section of the Rolls-Royce department.

MR. E. H. LANCASTER notifies us that he will be at the Birmingham Show in the interests of the new 1905 Cléments, and will be glad to arrange business re these with Midland agents.

MESSRS. LINTINE AND CO., of 23, Great Eastern Street, notify us that they have been appointed the sole concessionaires for "Le Radium," one of the latest motor lamps. This lamp, we learn, is to be marketed at a very moderate price, considering its efficiency.



Since the middle of December last, the above omnibus has been running for the London General Omnibus Company on the Hammersmith Road up to Piccadilly Circus, and, as far as we have been able to judge by personal experience, appears to be working thoroughly satisfactory. This particular vehicle is one of the "Orion" machines, built in Switzerland, different models of which we have been able, from time to time, to reproduce in our pages. The particular pattern of this vehicle has been built for the special purpose of accommodating the existing horse-drawn omnibus body with a minimum of alteration, and from this point of view the experiment is an interesting one to watch, as in a measure, provided the present superstructures of the omnibuses can be utilised in this manner, the greater part of the argument against adopting mechanical traffic generally for public service vehicles is swept away.

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

British Motor Boat Club Proprietary (Limited), 9, Arundel Street, Strand, W.C.—Registered with 20 members, each liable for £1 in the event of winding up. Object, to maintain and conduct a club for the encouragement and development of motor boating in the British Isles. The management is vested in an administrative committee.

English Motor Car Company (Limited), Back Hanover Court, Regent Street, W.—Capital, £5,000 in £1 shares. Object, to acquire the business of the English Motor Car Company, carried on by A. L. Bayley at Hanover Court, W. First directors, A. L. Bayley and G. Peakes.

Mechanical Development Syndicate (Limited), 36, Victoria Street, S.W.—Capital, £9,000 in £1 shares. Object, to acquire certain patents and interests, and to carry on the business of manufacturers of and dealers in engines, boilers, motor cars, &c. First directors, C. H. Brown and R. P. M. Nickols, life directors; and C. King.

Whitlock Automobile Company (Limited).—Capital, £10,000 in £1 shares. Object, to acquire from W. H. Arnold the right and license to use the names of Whitlock and Aster, in conjunction, for the sale of complete motor cars, &c. First directors, T. P. Bryant (chairman), W. H. Arnold, S. D. Begbie, H. M. Simmons.

NEW ISSUE.

London Motor Omnibus Company (Limited).—Subscriptions are invited for an issue of 60,000 ordinary shares of £1 each at par in the London Motor Omnibus Company, Limited.

The company, which has a capital of £103,000, of which £100,000 is in ordinary shares of £1, and £3,000 in deferred shares of 1s. each, has been primarily formed, the prospectus states, to establish a system of motor omnibuses in London. It is considered that the company will possess a considerable advantage over omnibus companies working with horse traction which may decide to adopt motor traction, inasmuch as the company should not require to make any sacrifice of capital which must be incurred in so changing from one system of traction to another. The company will acquire the benefit of an agreement which has been made between the Motor Omnibus Trust, Limited, and Milnes-Daimler, Limited, whereby the latter agree to supply the company with motor omnibuses. These motor omnibuses will be similar to those which have been supplied by the Milnes-Daimler Company, and which are now running in Birmingham, Hastings, Eastbourne, Brighton, and other towns, and by Thomas Tilling, Limited, and the Atlas and Waterloo Omnibus Association in London, and also by the Great Western Railway Company and other railway companies in other parts of England. Under this contract, the first delivery of motor omnibuses is to take place by the 15th of March next. It would appear, from recent reports of two of the leading London omnibus companies, that the average takings of a horse omnibus are about £17 per week, whereas the directors are informed by the Birmingham Motor Express Company, Limited, that the takings of the motor omnibuses worked by that company, and which are of a capacity and speed similar to those of the omnibuses which the company will acquire, average £35 per week. The directors are Sir Henry Seton-Karr, C.M.G., Mr. E. H. Bayley, J.P., Mr. Clarence Freeland, and Mr. T. Ottey.

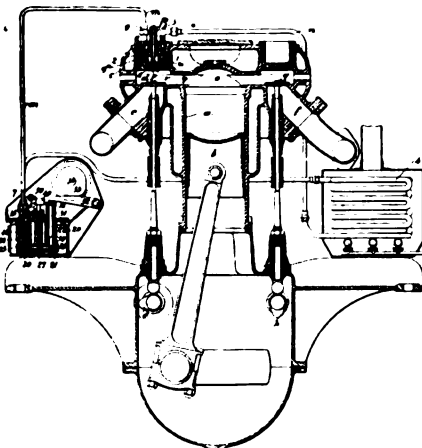
It is intended to start running the omnibuses on some or all of the following routes: Liverpool Street *via* Piccadilly Circus to Hammersmith; London Bridge *via* Charing Cross to Putney; Cricklewood *via* Marble Arch to Victoria; Charing Cross to Hammersmith *via* Victoria; Hammersmith *via* Shepherd's Bush to Oxford Street and City; Kilburn to Putney.



BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E.

The first date given is the date of application; the second, at the end, the date of the acceptance of the complete specification.

26,176. 30th Nov., 1903. Impts. in or relating to Oil Engines. J. E. and T. Thornycroft. Homefield, Chiswick, Middlesex. The object of this invention is an improved construction whereby the oil necessary for combustion is forced into the combustion chamber by means of high-pressure steam. There are seven figures. The drawing shows a sectional elevation of the engine constructed to this invention. *a* is the cylinder *b* the piston, *c* the air-inlet-port, *d* the inlet-valve, opened at the required times by the



cam, *e*, *f* the exhaust-port, *g* the exhaust-valve, opened by the cam, *h*; *m* and *n* are pipes for supplying oil and high-pressure steam respectively to the valve device which controls the admission to the combustion chamber, *o*. The valve, *p*, is formed with two conical faces, *q* and *r*, fitting the two seatings in the valve-cave, *u*, formed as a plug screwed into the larger detachable plug, *v*. The valve-face, *q*, controls a steam-inlet-port, *1*, that communicates through the chamber, *2*, through the branch, *3*, and pipe, *u*, with a steam generator, *4*. The valve-face, *r*, controls the oil-supply-port, *5*, having its outlet at *6*, which is an annular groove surrounding the valve and in communication through the pipe, *m*, with an oil-pump at *7*; the valve, *p*, has grooves or recesses for the passage of steam, and is closed by the spring, *8*, round the stem, *9*, having a

collar, *10*. The steam acts on a shoulder, *9a*, on the valve-spindle or stem within the steam chamber, *2*. The intention is that the valve, *p*, should remain closed when subjected only to the pressure of steam, but will open when also subjected to the pressure of oil delivered by the oil-pump to the groove, *6*. The steam then escapes through the steam passage, *1*, blowing the oil coming from the passage, *5*, into the combustion chamber, *o*. The oil and steam may be sprayed into the combustion chamber at any desired point in the stroke. The oil-pump consists of the casting, *20*, with an oil passage, *21*, the pump-barrel, *22*, the two valve chambers, *23* and *24*, provided with non-return valves, *25* and *26*, the oil escape passage or vent, *27*, controlled by regulating-spindle, *28*, and the surrounding oil reservoir, *29*. The pump-barrel, *22*, has a lateral opening, *30*, and is fitted with a pump-plunger, *31*. The pump-stroke is produced by a pivoted tappet, *32*, and a cam, *33*, on the shaft, *14*, driven by the engine. The pump-plunger, *31*, makes its upstroke by the coil-spring, *35*. The coil-spring, *40*, fits in the casing of the non-return valve, *26*. The screw-nut, *47*, controls the vent, *27*, and is screwed into the cover, *48*, of the oil reservoir, *29*. The upper end of the spindle by means of the lever-arm, *49*, and the rod, *50*, is controlled by the governor of the engine. — Dec. 7th, 1904.

25,881. 26th Nov., 1903. Impts. in and relating to Steam Generators. Communicated from abroad by Jules Baudet and another, of 12, Rue de Lanery, Paris, France. This invention relates to steam generators of the flash or instantaneous type. The generator consists essentially of a spiral coil immersed in a metallic bath which forms a heat reservoir enclosed by a receiver combined with two Field tubes. There are five figures. Fig. 1 is a central sectional elevation in a vertical plane. Fig. 2 is a plan. The annular receivers, *a* and *b*, each

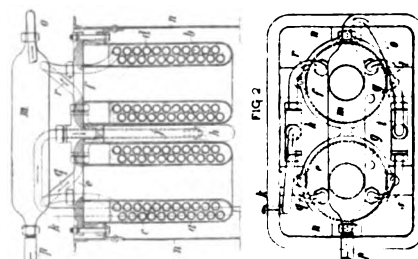
contain a metallic bath having immersed therein the spiral coils, *c* and *d*, each consisting of a double row of spiral tubes connected at the base so as to permit a continuous circulation of the fluid traversing them from one end of one row to the opposite end of the other row. The receivers are closed at the top by annular covers, *e* and *f*, having holes through which pass the pipes connecting the coils, *c* and *d*. The holes, *g*, are holes for metallic vapours. The upper ends of the inner rows of each of the coils, *c* and *d*, are connected by pipes, *q* and *r*, to the nozzles of a Field tube, *h*, and the remaining ends are joined by pipes, *s* and *t*, to nozzle of another Field tube, *i*, placed opposite the Field tube, *h*. The inner pipe, *o*, of the tube, *h*, connects to the feed water supply, *k*, the corresponding pipe of the Field tube, *i*, connects by the pipe, *o*, with the end of a steam collector, *m*, connected at the other end to a steam supply pipe, *p*. The casing, *n*, surrounds the receivers, *a* and *b*, and the Field tubes, *h* and *i*, and also encloses a furnace placed at the bottom beneath the receivers. The closed end of the pipe, *r*, has a number of perforations through which the feed water is delivered on to the wall of the tube, *h*, directly heated by the furnace gases. The steam produced in the tube, *h*, divides into two streams at the top, which pass through the pipes, *q* and *r*, to the coils, *c* and *d*, immersed in the fusible metal in the receivers, *a* and *b*. This metal serves as a heat reservoir, maintains and controls the temperature, and obviates the effect of irregularities of firing. The steam leaving the coils, *c* and *d*, passes through the pipes, *s* and *t*, to the Field tube, *i*, thence to the collector, *m*. The tube, *i*, superheats the steam, and the pressure is maintained in the collector, *m*. — Dec. 7th, 1904.

Patent Specifications Published.

Applied for in 1904.

Published December 26th, 1904.

- 468. A. SOAMES AND W. LANGDON-DAVIES. Change-speed-gear.
- 856. H. L. CALLENDAR. Variable gear.
- 1,316. J. ARMITT. Change-speed gear.
- 2,008. SOC. ANON. "HERALD." Explosion motors.
- 2,642. E. PERKINS. Under-carriages.
- 2,675. L. TOLCH. Driving mechanism.
- 2,742. J. R. STEPHENS. Belt fasteners.
- 2,908. T. E. MITTON. Oil pump.
- 2,943. R. ROSE AND R. CATT. Starting device.
- 3,152. E. DU BOULAY. Engine feed-pumps.
- 5,756. T. STEWART. Anti-skidding appliances.
- 23,498. FORD MOTOR CO. Exhaust mufflers.
- 23,677. A. LANGUMIER. Electric tremblers.
- 28,961. DE FRIES ET CIE. AKT. GES. Change-speed gearing.



The Automotor Journal, January 21st, 1905.

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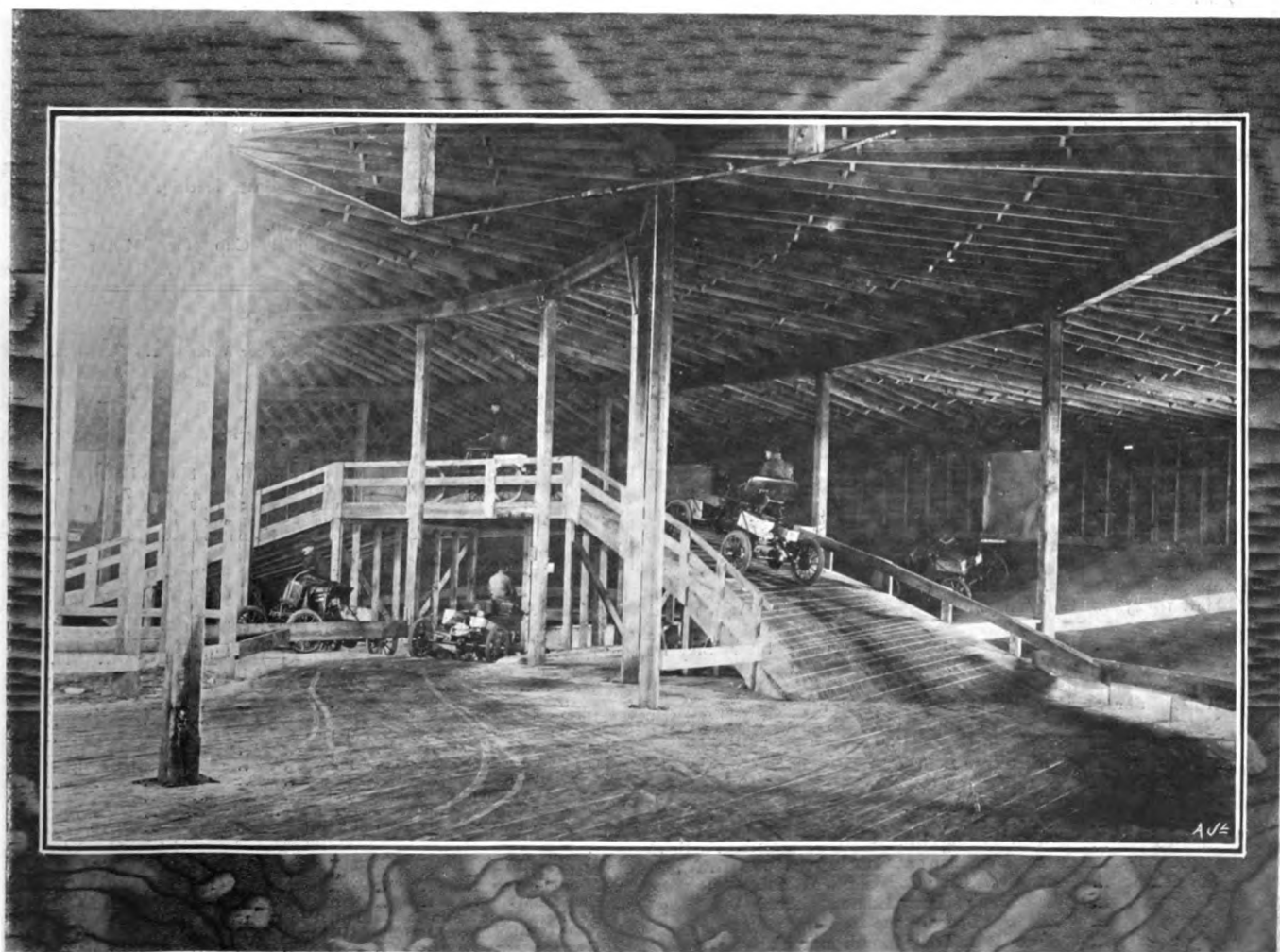
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DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
Jan. 21-28 ...	Birmingham Motor Car Show (Bingley Hall).
Jan. 23 ...	Motor Fuels, by Dr. W. R. Ormondy (Scottish A.C.).
Jan. 24 ...	Lesson VI.—On the Internal Combustion Engine (Ladies' A.C.).
Jan. 26 ...	*Problems of Traffic, by Mr. J. Swinburne.
Jan. 27-Feb. 4	Crystal Palace Automobile Show.
Feb. 7 ...	Motor Mountaineering in the Alps. Illustrated lecture by Capt. Deasy (Ladies' A.C.).
Feb. 10-18 ...	Society of Motor Manufacturers' and Traders' Exhibition at Olympia.
Feb. 10 or 17	*Quarterly 100 Miles Trials.
Feb. 13 ...	Motor Volunteer Corps Dinner (Trocadero).
Feb. 15 ...	A.C.G.B.I. Annual Dinner (Hotel Cecil).
Feb. 24-Mar. 4	Edinburgh Motor and Cycle Show.
Feb. 24 ...	Manchester Motor Show.
Mar. 3-11 ...	Liverpool Motor Cycle Show.
Mar. 8 ...	*A.C.G.B.I. General Meeting.
Mar. 18-25 ...	Cordingley and Co.'s Exhibition (Agricultural Hall).
Apl. 3-8 ...	Auto Cycle Club Light-weight Motor Bicycles Trial (1,000 Miles).
Apl. 26-May 31	*Light Van Trials.
Apl. 29 or May 1	May Day Parade
May 6 ...	Auto Cycle Club Hill Climb.
May 11-13 ...	Scottish A.C. Reliability Trials.
May 12 or 19 ...	*Quarterly 100 Miles Trials.
May 30 ...	*Gordon-Bennett Cup, British Eliminating Trials.
May 31 ...	Auto Cycle Trials.
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.).
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 8 ...	Auto Cycle Club Consumption Trial.
July 13 ...	*Hill-Climb (Henry Edmunds Trophy).
July 19 ...	*Brighton Speed Races.
July 24-28 ...	*Motor Boat Trials (Southampton).
Aug. 11 or 18	*Quarterly 100 Miles Trials.
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.
Sept. 12 ...	Auto Cycle Club Race Meeting.

* Automobile Club of Great Britain and Ireland Events and Papers.

Sept. 14 ...	*Tourist Trophy (Isle of Man).
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).
Sept. 18-Oct. 3	*Reliability Trials.
Oct. 4 ...	*Speed Trials.
Nov. 10 or 17	*Quarterly 100 Miles Trials.

Foreign Events (Trials, Races, &c.).

1905.	
Jan. 21-Feb. 6	Turin Automobile Exhibition.
Jan. 23-28 ...	Ormond-Daytona Beach (Cal.) Meeting.
Feb. 4-11 ...	Chicago Exhibition.
Feb. 4-12 ...	Stockholm Meeting and Ice Racing.
Feb. 4-19 ...	Berlin Automobile Exhibition.
Feb. 11-25 ...	Cannes Automobile Fortnight.
Feb. 13-16 ...	Detroit Exhibition.
Feb. 15 ...	Turin Automobile Salon.
Feb. 18-25 ...	Versailles Reliability Trials (A.C. Seine et Oise).
Mar. 13-18 ...	Boston Exhibition.
Mar. 15-Apl. 9	Copenhagen Exhibition.
Mar. 16-29 ...	Vienna Exhibition.
Mar. 27-Apl. 5	Washington Exhibition.
Apl. 2-16 ...	Monaco Motor Boat Fortnight.
Apl. 14-23 ...	Nice Automobile Week.
Apl. 17 ...	Speed Mile and Kilometre (Nice).
Apl. 18 ...	Coupe de Caters (Nice).
Apl. 20 ...	Coupe Burton (Cannes).
Apl. 20-21 ...	Cannes Motor Boat Meeting.
Apl. 23 ...	Coupe Provinciale (Nice).
May ...	Paris Industrial Vehicles Trials (A.C. France).
May 11-25 ...	Stockholm Automobile Exhibition.
May 14 ...	International Motor Cycle Cup.
June 26 ...	Mont Cenis Hill Climb.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Calais-London (Motor Boats).
Aug. 6-9 ...	Paris-Trouville (Motor Boats).
Aug. 10 ...	Gaston Menier Cup (Motor Boats).
Aug. 11 ...	Anthony Drexel Cup (Motor Boats).
Aug. 12 ...	International Cup for Motor Boats.
Aug. ...	Herkomer and Bleichroder Races.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Vincenzo-Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.
Sept. 3-10 ...	Royan Meeting.
Sept. 3-10 ...	Spa Automobile Club.
Sept. 11 ...	British International Cup for Motor Boats (Arcachon).

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NOTICE.—An 8-page Index to Volume IX. (1904) is published free with the current issue.

PASSING EVENTS.

A Miscarriage of Justice.

ONLY last week we had the pleasure of recording a case in which the legal experience, natural acumen, and sound common sense of Mr. Loveland Loveland, K.C., the Chairman of the Clerkenwell Quarter Sessions, was responsible for the quashing of a very absurd conviction by a magisterial court, the event being even more satisfactory as one of its consequences was that costs were awarded to a motorist against the police. Possibly the other magistrates who sit at the Quarter Sessions under the presidency of Mr. Loveland Loveland were dissatisfied with the clemency shown to an automobilist and seemed to have determined on a plan by which, when the next automobile case came before them, they would at one and the same time see that the case went against the motorist, and that Mr. Loveland Loveland should receive a rap over the knuckles. The case, as our readers will see from the details we give below, has all the appearance of a serious miscarriage of justice.

Some time ago Capt. Skeffington Smythe was proceeding along Holborn in his electric landaulette, when the traffic was brought to a stop by one of the policemen on duty at the top of Chancery Lane. Capt. Skeffington Smythe's landaulette was at the head of the line of traffic, and when the policeman apparently dropped his arm the landaulette proceeded forwards a few yards, whereupon the policeman stopped the car, took the driver's name and address, and issued a summons. For a breach of the traffic regulations our readers would naturally suppose? Not a bit of it. For driving to the danger of the public under Section 1 of the Motor Car Act. Was anything more monstrous ever heard of? Had a hansom cab done the same thing it would have been equally guilty, and the offence, if any was committed, had no more to do with the Motor Car Act of 1903 than it had to do with the Whiteboys Act of 1783, or the Statute of Mortmain. Nevertheless, the magistrates' Court in the first instance convicted.

The appeal came on last week at the North London Quarter Sessions at Clerkenwell, with Mr. Loveland Loveland, K.C., in the chair. Mr. Moresby White, who appeared for the appellant, stopped arguing the case, as from the chairman's observations it was quite clear that Mr. Loveland Loveland had determined to quash the conviction. When Mr. Moresby White had finished his case, which he cut short owing to the understanding that the Bench, as represented by the chairman, was in his favour, the other magistrates suddenly informed the chairman that they had decided by a majority to affirm the conviction, needless to say to the profound astonishment of everyone in Court. The other magistrates had not by a single word or act given the slightest occasion for supposing that they had intended to act in this way. Indeed they had permitted Mr. Moresby White to cut short his defence on the contrary assumption. And even Mr. Grain, who appeared for the police, was quite convinced that the Court was against him, for he declared, "I have seen for some time the Court is against me. I do not feel justified in continuing." Then suddenly the other magistrates "pounced," and in their desire to support the conviction of a motorist—against the weight of the evidence and in the grossest discourtesy to their own chairman, whose skill and knowledge have become

famous, and who has acquired a considerable reputation for the manner in which he has presided over the Clerkenwell Court for a considerable period—they without any consultation affirmed the conviction.

Against all Precedent.

NOT only was the action of the other magistrates against the weight of the evidence, and discourteous in the highest degree to their able and experienced chairman, but it was against all precedent. The Quarter Sessions at Clerkenwell have from time immemorial been managed and conducted entirely by the chairman. The other magistrates have sat with the chairman, but they have never been in the habit of exercising a determining voice. Their attendance has been complimentary or ornamental only. They have the right to overrule their chairman, but

"It is a custom

More honoured in the breach than the observance."

It is as if when the law lords of the House of Lords were hearing a case, a number of its ordinary members should troop in and attempt to overrule their decision. This unusual action of the Quarter Sessions magistrates has been taken in a singularly bad case. Not only was the weight of the evidence altogether in favour of the appellant, but the indictment was bad on the face of it. To attempt to bring it under the Motor Car Act of 1903 is, as we have already pointed out, utterly unjustifiable, and is most unquestionably bad in law. The object, of course, was to get the unfortunate driver's licence endorsed, and in this, so far, the police have succeeded.

But ought they to be allowed to do so? It must be remembered that if this conviction is allowed to stand it will be the easiest thing possible to get motor car drivers' licences endorsed. If it is to become a settled law that where a hansom cab driver can only be proceeded against for a breach of the traffic regulations, a motor car driver is to be proceeded against under the Act of 1903, and have his licence endorsed, the power that it will place in the hands of the police for mischief will be enormous. There are two points, therefore, on which we should like to see an appeal, if an appeal is possible, lodged. One is that the indictment was bad, through being brought under the wrong Act, and the other is that the offence not being really one under the Motor Car Act, there is no excuse whatever for endorsing the driver's licence.

Carrying Things to the Verge of Absurdity.

CASES like the above strongly confirm the view which Mr. Moresby White puts forward in his Paper, read before the Automobile Club last week (which we reproduce in another column), that the Act is being stretched to cover occasions which were certainly never meant to come under it by its framers. Suppose a policeman is holding up the traffic and in so doing is stopping a hansom cab and a motor car which are standing side by side awaiting his lofty permission to proceed along the street. Let us suppose that both, making the same mistake, imagined the extended arm of the policeman to have dropped towards his side, while it was still (or asserted subsequently by him to be) extended laterally like a railway signal. The drivers of both those vehicles have committed identically the same offence, but the cab driver can be fined 10s. and the motor car driver £20. What the cabman does is merely infringing a

traffic regulation, while what the motor car driver does is now declared to be driving to the danger of the public, an offence for which he will have his licence endorsed, and that, after all, is in most cases the worst part of the penalty, and one that touches him most nearly. Where is the line to be drawn? Almost any offence excepting sacrilege can be committed in a vehicle, and many people have been proceeded against for doing what they ought not in both two and four-wheeled cabs. Assaults have probably been amongst the most common of such offences. Is it seriously proposed that if a driver of a motor car happened in a moment of exasperation to punch the head of a person he was driving, and was subsequently fined therefore, that his conviction for the assault should be solemnly endorsed on his licence? The wording of Section 4 is both ludicrously wide and loose, and ordains for the case of any conviction "in connection with the driving of a motor car" that the Court "shall cause that the particulars of the conviction be endorsed upon the licence." Why, almost anything that a driver does when he is driving his car can be covered by this. Even the framers of the 1903 Act presumably thought that common sense would be used in interpreting it. As this seems not to be the case, these points ought to be settled by appeal to the Divisional Court.

Long-Winded Indian Names in a Motor Car Case.

MORE than once have we had occasion to point out to what an extent the peculiar names in which the inhabitants of India indulge tend to enliven the proceedings in police courts. A recent motor car case which came before the Mazagon Police Court in Bombay is a further instance in point. In this action, one Rahimtoola Abdulla, a Borah, was charged with driving a motor car in a rash and negligent manner. We plead ignorance as to what a "Borah" may be. It is possible that it is, after all, only the Hindoo equivalent for the Anglo-Saxon "bore," but the context would lead us to suppose that its signification is "scorcher." The said Rahimtoola Abdulla was further accused of driving the car without a licence, so that it may transpire that a "Borah" is a person who undertakes to carry out functions or services which he is not legally entitled to perform. Rahimtoola Abdulla was not alone in the charge. One Suleman Sodagar was also charged with employing Rahimtoola to drive the car for him, well knowing that he was not in possession of a licence. The onomatological confusion was not rendered less by the fact that the accused were defended by one Sorabshaw B. Kopadia. It was stated in evidence that the rash Borah had run over a foot passenger and injured him to such an extent that he had to be carried to the Jamsetjee Jejeebhoy Hospital—to the European mind a possibly serious exaggeration of his affliction. Characteristically, the evidence of the second accused was taken before that of the first accused, and the second accused declared that he did not employ the first accused to drive the car, but that the car belonged to his (the second accused's) grandfather, who had duly applied for licences both for himself and the first accused. This evidence was somewhat discounted by the fact that the first accused pleaded that he had not driven the car rashly, but admitted that he had driven it without a licence, and put the blame on a number of contingent circumstances. Finally, the first accused was fined 75 rupees, and the second accused acquitted, the magistrate making

nasty remarks about the speed at which other people drove motor cars. The speed mania has not yet spread to India, and 15 miles an hour is there considered a rapid pace, so what the magistrates will do if ever the speed mania takes possession of Indian automobilists it is difficult to imagine. In the meantime, we would point out that these things are not to be taken too seriously. We should not be at all surprised to find that there was no motor car, and no accident whatever, Indians making a habit of deciding their actual personal disputes by imaginary cases which they put before a magistrate to settle. This has been a source of great trouble to conscientious Indian administrators, particularly when they are new to their work. If hypothetical motor car cases are to be put before them, their lot in future will indeed be a terrible one.

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The Wye as a River for Motor Boating.

THERE is no more beautiful river in England, or indeed perhaps in Northern Europe, than the Wye that flows into the Bristol Channel. Miss Braddon is said to have once called it "the Rhine of England." It is not, as a matter of fact, the least like the Rhine. The Neckar, or better still, the Moselle, would be vastly more suitable comparisons. It is exquisitely beautiful rather than grand and romantic, and those who have seen the valley from Chepstow up to Tintern, and the river winding through the small plain in which stands the old mediæval town of Monmouth, realise—and are generally fond of saying—that those who do not know the river are ignorant of the most beautiful scenery of their native land. There has always been good boating on the river. Steam launches, in fact, have been able to run up as far as Monmouth, and rowing boats up to Ross, Hereford, and even further in favourable years. Up to Monmouth, at any rate, the river ought to be, as it is, available for motor boating, the only disadvantages being the very violent tides, which at Chepstow rise higher than anywhere else in the United Kingdom, and to see the flood tide running up the lower reaches of the river is a sight not easily forgotten. This, however, is the only disadvantage of the portions of the river nearest the mouth. Higher up the fairway is rather uncertain, there being a good many rocks and shoals. It is satisfactory to hear, therefore, that it is now being proposed locally to remove the majority of these obstructions, and so render the river available for lighter craft, which will, of course, include motor boats, up as far as Hereford. No more delightful tour can be imagined. The scenery is a revelation to people accustomed merely to the more prosaic portions of the British Islands, and about the air and the population lingers much of the picturesqueness so characteristic of the West Country. In fact, if the Wye is opened up in the manner suggested, it ought to prove a Paradise for the motor boatist, and a very acceptable source of profit to the local innkeepers and tradesmen.

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COMMENDABLE progress is being made in Paris in the application of self-propelled traction to fire-engines in the French metropolis. Two electric fire-engines have been added to the existing equipment together with six salvage vehicles and two large automobiles for transporting the brigade. In addition an electric lorry is being built for the service of the Corps.

THE STRAKER-SQUIRE PETROL OMNIBUSES AND COMMERCIAL VEHICLES.—PART II.

The Engine.

THE 24-h.p. engine, removed from the chassis, is shown from both sides, and from the two ends, in Figs. 7, 8, 9, and 10, while its internal construction is rendered quite clear in Figs. 11 and 12—which are respectively a longitudinal vertical section and a front elevation. Although differing so greatly in appearance from the majority of engines, yet the cylinder-castings, forming each pair of cylinders, are not in reality very unlike those usually employed. The inlet-valve-chambers are arranged on one side of the heads, the exhaust-valve-chambers on the other side, and the low-tension igniters are fitted through the walls of the former. The chief difference, so far as the cylinders themselves are concerned, is that the

by which it is driven, from the crank-shaft. The intermediate mechanism (which is most clearly seen in Fig. 12) consists of a vertical shaft, E^1 , fitted with spiral gear-wheels near each end, the lower of them meshing with the corresponding wheel, A^2 , on the crank shaft, and the upper with the corresponding wheel on the cam-shaft, E ; the weight of the shaft, E^1 (as also the thrust of its gear wheels), is taken by the ball-bearing, E^2 , as seen. The cam-shaft itself is made of nickel-steel, and the cams are solid with it, while this part—as also the rollers on the rocking levers—are all case-hardened. By arranging the shaft in this way, the entire valve-gear is not only rendered accessible, and can be easily removed bodily,



The 24-h.p. Straker-Squire Chassis, fitted with testing body, which is now undergoing a 2,000 Miles Reliability Trial, under the direction of the Automobile Club.

valve spindles project upwardly, instead of downwardly, and that the inspection covers—opposite the valves—are consequently on the under side, instead of on top. The castings are made so that the cylinders originally have central openings at the top, the openings being subsequently fitted with the handhole plugs, A , while the top of the water jackets is completed by screw plugs as seen in Fig. 11.

The inlet valves, B , on the right side, and the exhaust valves, C , on the left side, have their inspection-covers held up in place—in pairs—by the yokes, B^2 and C^2 , respectively—each by a single nut. The valves are operated by small, pivoted levers, B^1 and C^1 , respectively, as also are the low-tension igniters, D , by the pivoted levers, D^1 . These pivoted levers are supported by a casing that contains the cam-shaft, E , and this casing is bolted to the cylinder castings. The casting forms an oil-retaining casing about the shaft, E , and at its front end also encloses the gear-wheels,

but it is also conveniently out of the way of the crank-chamber.

The inlet and exhaust valves, which are all interchangeable, are of very large diameter, and the parts communicating with them are also of ample size. The actual valve seats are arranged in recesses in the valve chambers, so that the gases tend to pass around the valves more equally than they usually do, and the tendency for the exhaust valves to be heated to a greater extent on one side than the other is largely eliminated. The valve-chambers are also thoroughly well jacketed, the water being led in (at G^2) between each pair of exhaust valve-chambers, and out at corresponding positions (G^3) on the other side of the engine.

The crank-chamber is made of two aluminium castings that have three long bearings formed between them for the crank-shaft, and special provisions are made for ensuring thorough lubrication for all the bearing surfaces. For this purpose—and in order also to reduce

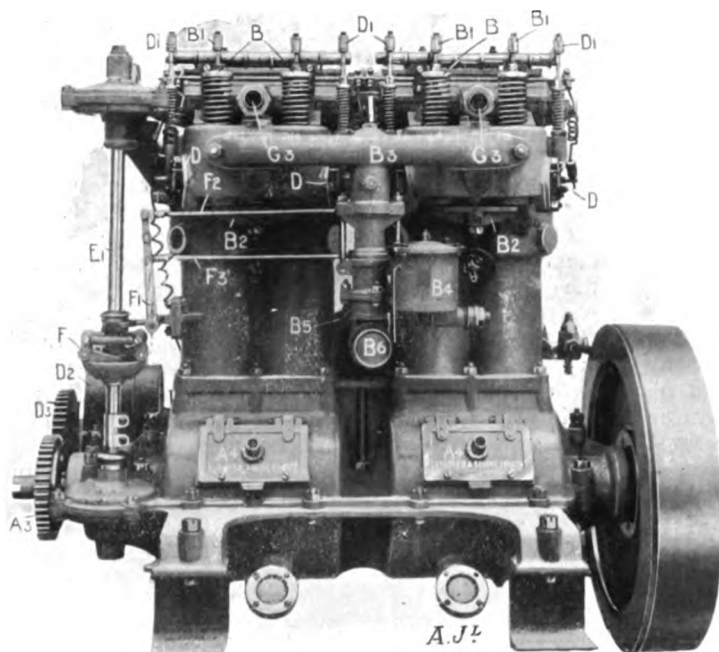


FIG. 7.—View of the 24-h.p. Straker-Squire Petrol Engine, from the left side, showing the Inlet-Valves, Igniters, and the Carburettor.

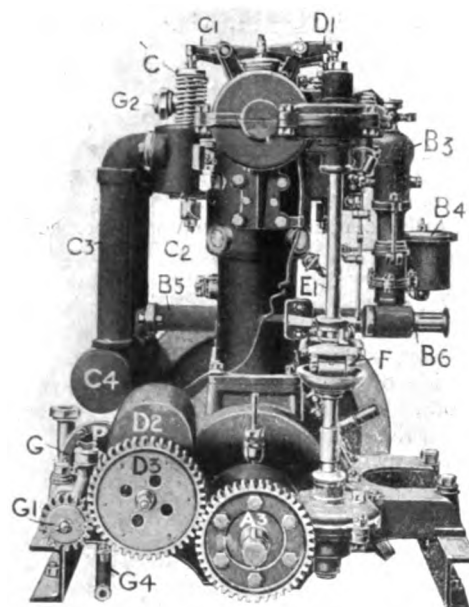


FIG. 9.—Front View of the 24-h.p. Straker-Squire Petrol Engine, showing the arrangement of the Valves, the Valve-Operating-Mechanism, and the Governor, as also the Circulating-Pump, the Magneto, and the Carburettor.

the weight of the moving parts—the nickel steel connecting-rods are made hollow, and are fitted with small oil scoops, A¹, at their lower ends; the scoops pick up the oil, and distribute it through the rods when the engine is running. Every attempt, too, has been made to ensure smooth running for very long periods without attention, for the pistons are nearly two diameters long, and the connecting-rods are also of unusual length. All

the bearings on the crank-shaft—which is of nickel steel—are lined with white metal, and oil ducts are provided for ensuring proper circulation to them. As will be noticed from Figs. 7 and 8, the inspection doors, A⁴, on each side of the crank-chamber are of large size, and can be made use of effectively.

One carburettor is employed for all four cylinders, this being fixed to the induction pipe, B³, as seen in our

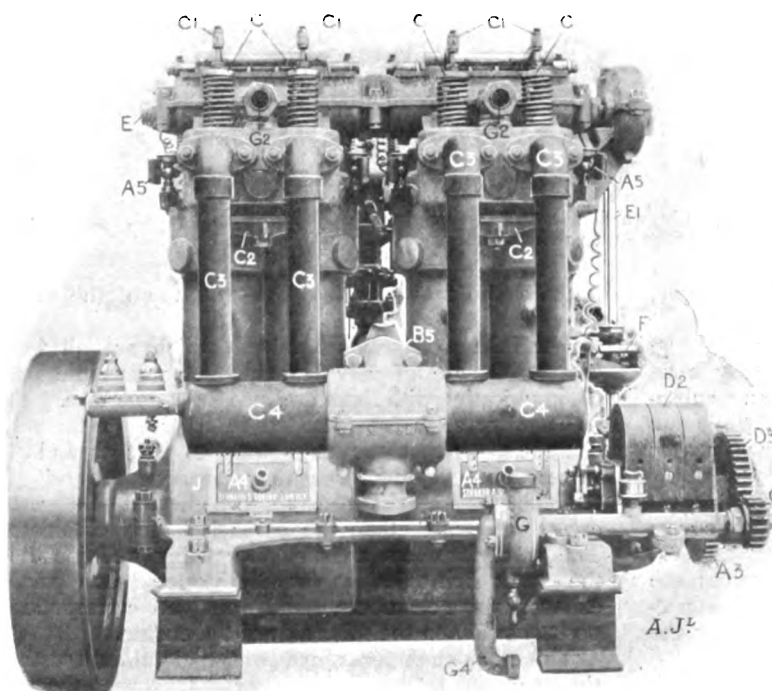


FIG. 8.—View of the 24-h.p. Straker-Squire Petrol Engine, from the right side, showing the Exhaust-Valves, Magneto, and Circulating Pump.

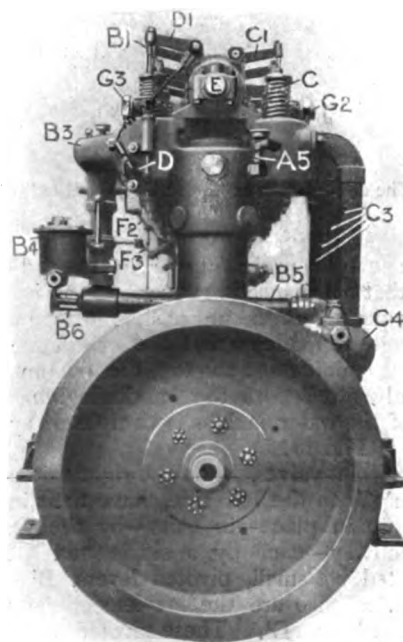
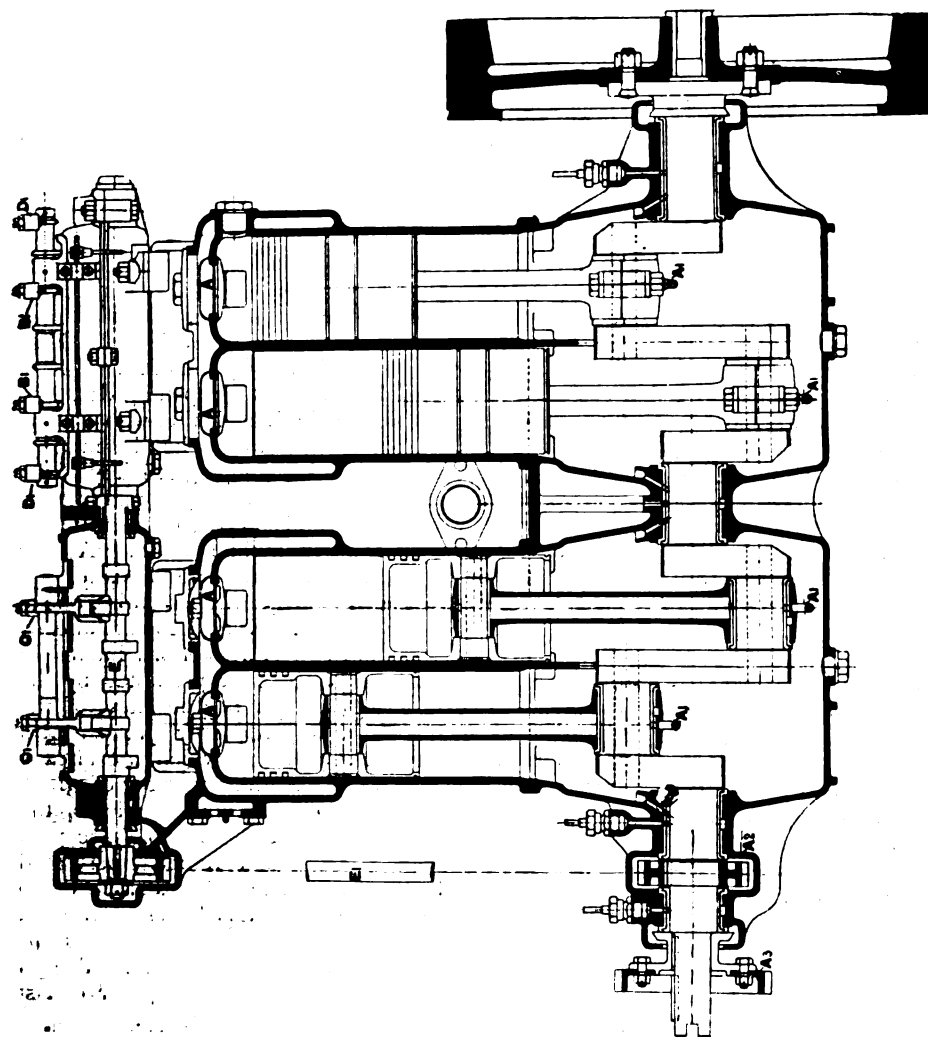
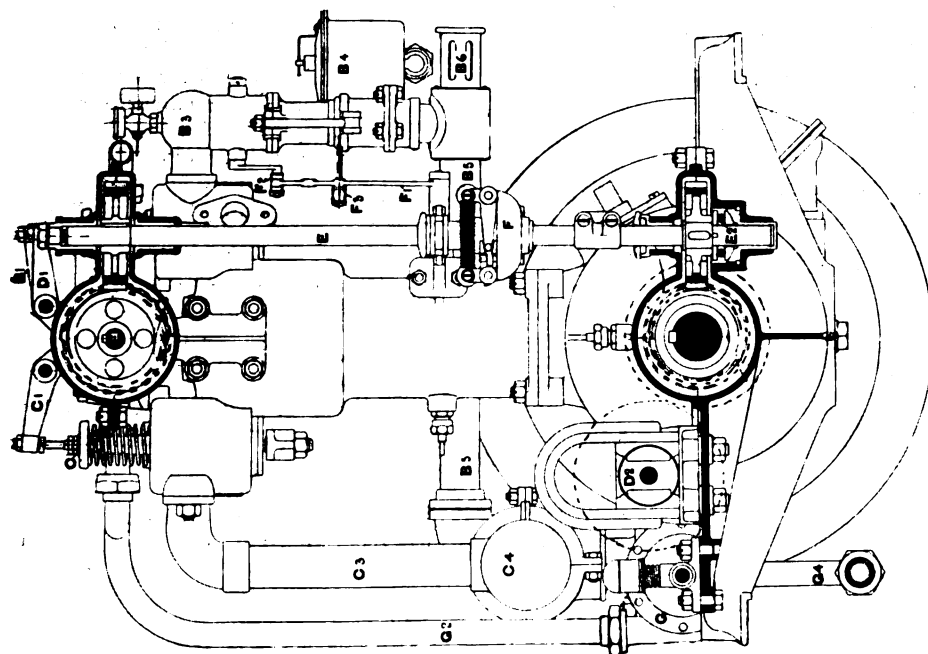


FIG. 10.—Rear View of the 24-h.p. Straker-Squire Petrol Engine, showing the arrangement of the Valves, the Igniters, the Carburettor, and the Exhaust Pipes.

illustration. It has the usual float-feed-chamber, B⁴, and it draws its air supply from the neighbourhood of

the exhaust, through the pipe, B⁵, while the temperature of the air can be regulated by the cylindrical valve, B⁶,



FIGS. 11 AND 12.—Longitudinal Vertical Section (part in elevation), and Front Elevation (part in section) of the 24-h.p. Straker-Squire Petrol Engine.

that admits more or less cold air as required. Between the carburettor and the induction pipe is a throttle-valve, controlled by the rod, F², and lower down is another valve (controlled by the rod, F³) that simultaneously regulates the air supply. The two rods, F² and F³, are both connected with the automatic governor, F, through the bell-crank-lever, F¹, as seen, so that an approximately constant richness of mixture is at all times maintained. When the engine is fixed in place in the car, the hand-lever, B⁷, on the dash—to which reference has already been made—is interconnected with this governing system, and constitutes the only hand-control needed for the engine.

Separate exhaust pipes, C³, are led from each cylinder to a common expansion-chamber, C⁴, that lies alongside the engine, and the gases are subsequently taken by a single pipe—see Figs. 2, 3, 4 and 5—to the exhaust-box, C⁵, that is placed across the centre of the chassis. On some of these vehicles, the exhaust-gases are employed for injecting sand beneath the tyres of the driving wheels—to prevent slipping—the sand-boxes being opened and closed at will from the driver's seat.

The low-tension igniters, D, are of much the usual make-and-break type, and the necessary current is supplied to them from the magneto, D², which is fixed to the crank-chamber, as seen in our illustrations. The magneto is driven at the same speed as the engine, by the fibre wheel, D³, meshing with the wheel, A³, on the crank-shaft. The wheel, D³, also serves for driving the circulating-pump. This pump is of the centrifugal type, and runs at a high speed. Its spindle is carried by an unusually long bearing, which, it will be noticed in

Fig. 8, extends from the pump itself to its spur-wheel, G^1 . The external spur-wheels, G^1 , D^3 , and A^3 (although not so shown in the illustrations) are enclosed in a light metal casing to protect them from dust. No provision is made for varying the "time" of ignition.

From the foregoing description, and from our illustrations, it will be realised that, in the matter of design, at any rate, the Straker-Squire chassis has been most care-

fully considered in all details. It only remains therefore to say that it is well built throughout, and that the workmanship leaves nothing to be desired. It is such machines as these that have recently done so much to prove the superiority of the "motor" over the horse for continuous hard work, for reliable working, and for commercial economy, where heavy loads have to be carried speedily, or over long distances.

Table of Reference Letters for the Straker-Squire Illustrations.

A Manholes in cylinder heads.	D ² Magneto.	J Three-speed gear-box.	N ⁶ Low-speed spur-wheel on shaft, N ⁵ .
A ¹ Oil scoops on connecting rods.	D ³ Spur-wheel on magneto shaft.	J ¹ Second-motion shaft.	N ⁷ High-speed spur-wheel on shaft, N ⁵ .
A ² Spiral gear-wheel driving cam-shaft.	Cam-shaft.	J ² "Reverse" spur-wheels.	N ⁸ Underframe carrying gear-box, N ⁵ .
A ³ Spur-wheel driving magneto and pump.	¹ Vertical shaft driving shaft, E.	J ³ 1st speed spur-wheel.	N ⁹ Swinging links supporting N ⁸ .
A ⁴ Inspection doors in crank-chamber.	² Ball-thrust-bearing for shaft, E ¹ .	J ⁴ 2nd speed spur-wheel.	P Sprockets on countershaft.
A ⁵ Half-compression cocks.	Governor.	J ⁵ 3rd speed spur-wheel.	P ¹ Differential sleeve on same.
B Inlet-valves.	³ Bell crank lever.	K Brake-drum on second-motion shaft.	P ² Low-speed spur-wheel on differential shell.
B ¹ Rocking levers operating same.	⁴ Rod operating throttle-valve.	L Change-speed levers.	P ³ High-speed spur-wheel on differential shell.
B ² Yokes for inspection plugs.	⁵ Rod operating air-valve.	L ¹ Rod operating second-gear box.	P ⁴ Differential gear.
B ³ Induction pipe.	⁶ Circulating pump.	L ² 1st and "reverse" speed operating bar.	P ⁵ Brake-lever.
B ⁴ Carburettor float-feed chamber.	⁷ Spur-wheel on pump-shaft.	L ³ 2nd and 3rd speed operating bar.	Q Compensating link.
B ⁵ Main air supply pipe.	⁸ Delivery pipe to cylinders.	L ⁴ Striking fork for second gear-box.	Q ¹ Rock-shaft.
B ⁶ Cold air regulator.	⁹ Return pipe connection.	M Propeller shaft.	Q ² Anchor rods.
B ⁷ Accelerator lever.	¹⁰ Suction pipe.	N Combined gear-box and differential casing.	R Radius rods.
C Exhaust valves.	¹¹ Clutch cone.	N ¹ Longitudinal shaft in second gear-box.	R ¹ Cushion springs.
C ¹ Rocking levers operating same.	¹² Coupling in same.	N ² Bevel-wheel on shaft, N ¹ .	S Sprags.
C ² Yokes for inspection plugs.	¹³ First-motion shaft.	N ³ Thrust bearing on shaft, N ¹ .	
C ³ Exhaust pipes.	¹⁴ Pivoted clutch lever.	N ⁴ Bevel-wheel on intermediate shaft, N ² .	
C ⁴ Expansion chamber.	¹⁵ Clutch spring.	N ⁵ Intermediate transverse shaft.	
C ⁵ Exhaust box.	¹⁶ Clutch pedal.		
D Low-tension igniters.	¹⁷ 1st speed and "reverse" pinion.		
D ¹ Rocking levers operating same.	¹⁸ 2nd speed spur-wheel.		
	¹⁹ 3rd speed spur-wheel.		
	H ² Rod connecting pedal with clutch.		



A Warning to Inventors.—Until the present Patent Act came into force on the first day of this year, any inventor who filed a Provisional Specification used to get nine months to complete his application. Now he will only get six. This is a very important matter, and inventors should bear it in mind. The six months can be extended by one month on payment of a £2 fee as was formerly the case with the nine months' provisional protection, and where, in order to prevent publication, it is desired to delay the acceptance of the complete specification, this can be done up to one year from the date of application without payment of any extension fees. The period has been shortened from nine months to six in order to give the Patent Office the three extra months' time for making the search as regards novelty which the British Patent Office now for the first time undertakes. The main features of the new Act were dealt with by us in an article on October 29th, but the above point is so important that we have no hesitation in drawing attention to it at the commencement of the year. Inventors who are unaware of it may, of course, lose their patent applications altogether.

Noise an Offence under the Act.—A First Conviction.—Henry Earnshaw, of Tunbridge Wells, was at Greenwich, on January 17th, fined 20s. and costs for allowing a motor car, while it was stationary in High Street, Lewisham, to make a considerable noise. This conviction is the first in respect to this "offence" specified in Article V. of the Local Government Board Regulations, 1904. The exact wording of the charge was as follows:—

That he, being the driver of a motor car which was then stationary, and not through any enforced stoppage, did unlawfully fail to make prompt and effective use of all means provided for prevention of noise caused by the machine's action.

Brussels Automobile Salon.—Supported by all the Belgian automobile world, the Brussels Salon, which opened on Saturday last has, during the week, been attended by a very large number of visitors, the display of vehicles being a splendid index to the present state of the automobile industry, although following as it does so soon after the Paris show, practically no novelties of striking importance are to be seen. Samples of the finest cars of the various Continental manufacturers are prominent in the Exhibition, whilst through agents, some British cars are also in evidence. Great élat was given to the Exhibition by the official visit of the venerable King Leopold on the opening day, who was received by the Comte de Leidekerke, who accompanied the King throughout his tour, when he made a round of the principal exhibits, stopping at many of the stands a considerable time, displaying a personal interest in the points of each exhibit, and showing a great intimacy with the doings of the automobile world. At the Germain stand King Leopold made one of his longest halts, and here he was received by M. de Wandre, one of the directors of the Company. King Leopold already owns a Germain car, and the keenness of his interest in this particular quarter was no doubt prompted by the fact that he is ordering another of the latest of the Germain models. He was particularly pleased with the Germain omnibuses, some of which are already running on the London roads, and a number of which are shortly to be added to the regular service of the London Road Car Company. King Leopold accepted a photograph of one of these new vehicles, presented to him by M. de Wandre. The Mors stall was also singled out for close attention by His Majesty, who last year had in use a 30-h.p. car of this make, and has this year selected a similar type, but of 40-50-h.p. Théry's Richard-Brasier car, the Gordon-Bennett winner of last year, was carefully inspected by His Majesty.

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SPRING - WHEELS FOR MOTOR CARS.

Introduction.

THE desire to make the solid rubber tyre a more effective substitute for the pneumatic tyre, in point of comfort, has led many inventors to devise various ingenious wheels, in which springs have been so arranged as to absorb much of the shocks which would otherwise be transmitted to the hub of the wheel. A few such wheels have already been dealt with by us in the past, amongst these being the "Carmont"*—in which helical springs are introduced inside the steel tyre, and the tyre itself is made in segments to allow for the desired movement inside the rim; the "Henwood"†—in which the shocks are absorbed by a peculiarly constructed hub, containing rubber cushions; and the "Roussel,"‡ which was shown at last year's Paris Salon, and consists of an arrangement of flat springs that are bent into circular form, and are introduced between the hub and the rim. It is interesting to notice that entirely different arrangements of the "cushion element" have been adopted in each of these wheels, and it is evident, from the number of inventions, dating back into the thirties, which continue to be made, that there is still room for further modifications in this connection.

Although it is very doubtful whether many of those devotees of motoring as a sport to whom expense is a secondary consideration are ever likely to abandon the luxury of pneumatics in favour of the admittedly less comfortable spring-wheel—especially as the risk of puncture is constantly being reduced with improvements in tyre construction—yet there is, nevertheless, a very wide field for a good spring-wheel, provided that it can be rendered effective, durable and cheap.

On most pleasure cars, the consideration is chiefly one of comfort and convenience, but for the more popular types—and for commercial work in particular—it is purely a question of initial cost and of running cost. It would be a distinct advantage, both for the protection of the driving mechanism itself and of the fragile goods which are often carried by commercial cars, if some effective device could be produced which should add to the resiliency now obtained from solid rubber tyres with the usual suspension springs. It is just for this reason that there may prove to be a very great scope for a spring-wheel, provided that it can be constructed on sound engineering principles, and that it does not absorb much power.

It is, perhaps, not too generally recognised that there must of necessity be a considerable difference—in point of power absorbed—between pneumatic tyres and those of any other kind, even including spring-wheels. It is a fact well known to motorists that pneumatic tyres do not heat to anything like the same extent as solids when used under similar conditions—and heating is of course the chief outward and visible sign of loss of power in a tyre—but it may be found useful, perhaps, to point out what actually causes this great difference of heating in tyres and spring-wheels. When a pneumatic-tyred wheel is loaded with a certain weight, its internal pressure increases until the total pressure over the area of the tyre in contact with the road is equal to the weight of the load. The wheel is then in equilibrium, but the

internal pressure in the tyre has been increased by the reduction of volume consequent upon the flattening of the tread where it comes into contact with the road.

On a perfectly smooth road this flattening would remain constant, and the only work which would have to be continually done on the tyre would be that due to the bending of the rubber in the side walls. The work represented by this does not amount to very much even where the side walls are not as flexible as they might be, and the reason that it represents practically all the lost energy in the tyre (under these unusual conditions) is that the air inside the tyre is continuous all round the wheel and thus—since the pressure is raised uniformly throughout—no further compression takes place as the tyre rolls over the smooth road. The air is of course being continually displaced in the tyre as it rolls on the road, but this does not represent any appreciable work. The action is entirely different from that which would take place if a pneumatic tyre were built up in sections so as to form a series of independent pneumatic cushions all round the rim of the wheel. In this case the air is not continuous, consequently the compression of one cushion does not affect the others, and the air in each cushion has to be independently compressed and released as the wheel rolls over the ground. It may be quite true that nearly all the work done in compression is restored in expansion, but even so there is a certain amount of additional lost work which is not present with an ordinary pneumatic.

The foregoing case also partly explains the action of a solid rubber tyre, for the load compresses a certain portion of the tyre and the effect of the load is—so far as the compression is concerned—quite a local one. As the tyre rolls over the ideal smooth road, therefore, each successive piece of the tyre has to undergo compression, not once only but each time that it comes into contact with the road. It will have been noticed that the *cover* of a pneumatic tyre is subject to exactly the same drawback, but, owing to the difference in construction, the lost work in the solid tyre, through this cause, is a more serious one than in the case of the pneumatic. This lost work shows itself as heat which is generated by the molecular friction in the substance of the rubber, caused by its repeated compression and release.

In the less ideal, but more practical case of a wheel rolling over a bumpy road, the tyre is called upon to withstand a series of sharp blows. The result of each such blow is both in the case of the pneumatic and solid tyre, to momentarily flatten the tread beyond its normal amount. With a pneumatic tyre, this flattening increases the internal air pressure and there is a rise in the temperature of the air, but as the blow is of quite short duration the air almost instantly expands again, and in its expansion absorbs the heat generated by its previous compression. The tyre is thus brought back to its normal state and normal temperature, the flexibility of the walls of a pneumatic tyre being such that it responds instantly to variations of internal pressure. The consequence is that the compression and subsequent expansion of the internal air are so quick, and follow one another so rapidly, that there is no time for the heat in the air to communicate itself to the rubber. With solid tyres, on the other hand, the bumpy road only aggravates the normal state of affairs

* AUTOMOTOR JOURNAL, September 13th, 1902, and September 5th, 1903.

† AUTOMOTOR JOURNAL, November 7th, 1903.

‡ AUTOMOTOR JOURNAL, January 31st, 1903.

existing on a perfectly smooth road. A particular portion of the rubber undergoes compression and subsequent expansion, and each operation generates heat, with the consequence that the tyre tends to increase in temperature. A blow represents a certain amount of energy, and will do the same amount of work both on a pneumatic tyre and on a solid tyre. The difference lies in the fact that in a pneumatic tyre the air forms a medium capable of utilising the heat generated by the blow, thus maintaining the temperature of the rubber fairly constant, whereas in a solid tyre the blow, besides generating heat by compression, causes the tyre itself to generate heat by expansion, and thus the temperature of the rubber tends to increase.

⚙ Springs follow the example of the solid rubber by generating heat, both during compression and subsequent recovery, and therefore they can never equal a pneumatic in this respect. With the idea of overcoming such inherent drawbacks in mechanical substitutes for the pneumatic tyres, some inventors have arranged the pneumatic element either in the interior of the wheel or just beneath an outer solid tyre. The extent to which such devices as these may reasonably be expected to prove successful, depends so entirely upon the precise design in any particular case, that it is almost impossible to consider them collectively here. Some of them cannot be looked upon as spring-wheels at all, being in reality only semi-pneumatic tyres. It would not have been surprising to have found some resilient wheels using an internal arrangement of independent pneumatic cushions instead of springs, but we have not seen any spring-wheel so constructed.

It is possible with a spring-wheel, however, to emulate the pneumatic to a certain extent on a perfectly smooth road; that is to say, there is no necessity for the springs to be repeatedly compressed and released, since by suitably arranging them they might be compressed once and for all by the steady load, and only undergo increased compression for the shocks occasioned by a bumpy road. A little consideration will show that, to effect the above result, the load must never be directly carried by any one spring, and that, therefore, any system of *independent* springs arranged between the hub and the rim cannot possess this desirable feature, since the eccentricity of the hub in the wheel, while compressing the lower springs, either releases the upper springs or actually puts them in tension. It is only possible, therefore, to keep each spring in the system under constant compression, by interconnecting them, so that when one receives the load it transmits to each other spring in the system an equivalent force, and by so placing them that they only receive the load indirectly and with equal indirectness for all positions of the wheel.

It may be argued that the ordinary carriage spring arranged outside the wheels practically fulfils these conditions, and the main questions that naturally arise, when first approaching the subject, are, as to whether a spring-wheel—used in conjunction with any of the existing types of carriage-spring—is likely to prove more effective than improved forms of the carriage-springs themselves, and as to whether the springs used inside a spring-wheel can be relied upon to stand the continuous action to which they are naturally subjected, without suffering from undue “fatigue” or premature loss of elasticity.

There are two distinct duties that a spring-wheel, as such, may reasonably be expected to perform, in a way, and to an extent which is apparently impossible with carriage springs that are interposed between the axle

and the frame. By introducing springs between the tyre and the hub of the wheel, the local vibrations set up by the road on that particular wheel are to a great extent isolated from the vibrations of a similar character to which the other wheel on the same axle is subjected, with the result that these two sets of vibrations—which by no means necessarily synchronise with one another—are not superimposed on the axle to anything like the same extent that they now are. Another important point is that the arrangement of the springs inside the wheel itself materially reduces the actual weight of the rigid portions acted upon direct by inequalities of road surface, so that the parts which are compelled to vibrate—by being in direct contact with the road—have less inertia, and are able in consequence to more accurately follow the road surface. From this point of view, it is obviously an advantage, in a spring-wheel, to reduce the weight of the rim—and the parts that are rigid with it—as much as possible, and to arrange the springs as close to it as is feasible. It must, however, not be forgotten, in this connection, that there are many other important considerations which have at the same time to be taken into account, and that—for instance—it may often be advantageous to make the moving portion heavier, if, by so doing, the load can be more equally distributed over the springs, instead of being concentrated upon only one or even a few at a time.

Probably the chief merit that can be claimed for a spring-wheel, as against ordinary carriage springs—fitted in conjunction with a solid wheel—is that the very nature of the wheel itself renders the springs, contained in it, equally capable of acting in any radial direction, whereas, it is obvious, that any spring that is introduced between the axle and the frame, can only cushion such shocks as result from the tendency of obstacles on the road to *lift* the axle more or less vertically. It thus follows, that, when the tyre strikes an obstacle which is in front of it, only such springs as those that are fitted inside the wheel can cushion the blow received with any directness. With ordinary springs the surface of the tyre is compelled to act as a kind of cam that has to climb *over* the object, although it is only being forced directly *against* it, and the blow is merely cushioned so far as the actual *vertical* lift is concerned.

The other useful duty which a spring-wheel may be made to perform is of quite a different character. It is that of introducing a flexible cushion into the propelling mechanism, so that the engine is in less rigid connection with the tyre. The engine is thereby rendered capable of maintaining a more regular speed, even though the tyre does not always revolve at equal angular velocity. In some of the wheels already designed, the same springs are made to serve the double duty of supporting the weight of the car and of transmitting the driving effort of the engine.

In others, some form of claw coupling is used for transmitting the drive, and in them it is, of course, necessary to allow sufficient play not to interfere with the free action of the springs. It is also important that there should be no tendency for the two members of the coupling to jamb.

No matter what arrangement of springs be employed, it is always necessary to provide some form of guide which shall retain the outer wheel in its proper place, and resist any end-thrust that may be imposed on the axle. In some cases, the springs themselves afford no rigidity to the wheel in this respect, while, even where the springs are directly connected between the hub and

the rim, they obviously cannot be used to take such side strains. These guides generally take the form of side-plates or flanges attached to the hub, and overlap the felloe or some other suitable member that is rigid with the outer portion of the wheel. It is, of course, essential that the sliding contact between these two parts should be sufficiently free to avoid any risk of "seizing" or of interfering in any way with the action of the springs, while the importance of giving the guides sufficient strength to resist any strain that may be put upon them in practice, cannot be over-estimated.

It must also be remembered in connection with every spring-wheel, that the spring or springs are in equilibrium when the wheel is carrying no load, no matter what initial compression the springs may be given before they are put in place. It, therefore, follows that directly the load is put upon the axle, the hub must drop slightly, and become eccentric to the tyre. This has no particular

bearing on the action of spring-wheels, but it is a point which is easily overlooked by those considering the subject for the first time, and the erroneous impression is sometimes received that a spring-wheel can be made in such a way as to prevent the springs from coming into play at all until an uneven road surface is encountered.

As will be shown, a very considerable amount of ingenuity has been expended on the development of the spring-wheels that we are about to describe. It must, of course, be understood that these are not necessarily the best that have been devised, and that it is quite possible there may be others in course of development, which have not as yet come before our notice. Those referred to in this article will, however, serve to show the directions in which progress has been made, and we may add that a large measure of success has, apparently, already been obtained with some of them in practice.

THE HALFORD SPRING-WHEEL.

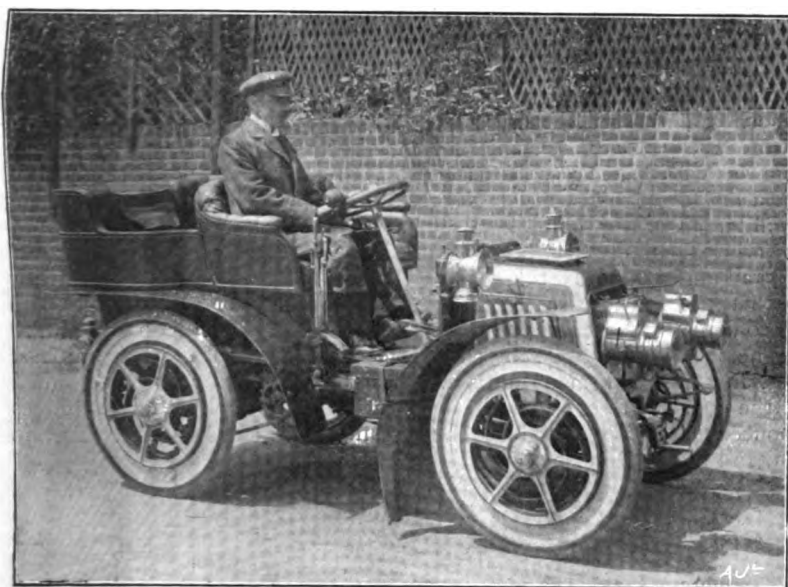


FIG. 1.—The Halford Spring Wheel.—Set of Experimental Wheels fitted to a Panhard Car.

ONE of the most simple of the spring-wheels at present on the market is the Halford, which is illustrated in Figs. 1, 2, and 3. Fig. 1 shows a Panhard car fitted with an experimental set of these wheels, in which the eccentricity between the hub and the wheel proper—due to the weight of the car—is quite distinctly seen in both front and back wheels. Fig. 2 shows a photograph, and Fig. 3 a line drawing of the detached wheel. In Fig. 2 one of the flanges on the hub has been removed to more clearly show the arrangement of the springs.

The Halford wheel is among those which, besides utilising the springs for reducing road shocks, also employs them for transmitting the drive from the hub to the wheel proper. In the wheels shown in Figs. 1 and 2, it will be noticed that the felloes are of unusual depth, but this is not an essential feature of the invention, but only of the particular experimental wheel from which the photographs were taken. In actual practice the felloes would be no deeper than with ordinary wheels.

As will be seen from our illustrations, the resiliency of this wheel is obtained from three spirally arranged plate springs. The outer ends of these springs are attached to the felloes by bolts, as shown in Fig. 3, while the inner ends are flattened out and drilled to form eye-pieces, which are thus secured by bolts to the flanges on the hub. It will be noticed that there is nearly one complete convolution in the spiral formed by each spring. The flanges to which the springs are attached at their inner ends are made solid with the radial arms which carry the guide rings. It will, of course, be understood that the springs themselves have little lateral stability, and that even if they had sufficient for ordinary purposes it would not do to rely on them to withstand all the severe side shocks which are often imposed on a wheel in the course of its ordinary work. For this



FIG. 2.—The Halford Spring-Wheel.—View of the Wheel with one of the Guide Plates detached, showing the arrangement of the Three Spiral Springs.

reason, therefore, it is necessary to provide some form of guide which shall prevent the springs from being unduly strained in a lateral direction, but shall at the same time leave them free to do their appointed work unrestricted. This device in the Halford wheel takes the form of an extension of the flanges on the hub, which for the sake of lightness consist of several radial arms terminating at their extremities in a guide ring which overlaps the felloe. There is, of course, one of these rings on either side of the wheel, so that they immediately take up any side strain which may be imposed on the wheel. It will be noticed that, except for any friction which may take place between the two members, the guide rings do not in any way impede the radial action of the springs, nor do they prevent them from being utilised as a spring drive.

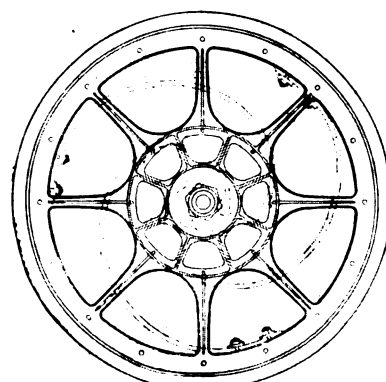


FIG. 3.—The Halford Spring Wheel.—Elevation of the wheel, showing the latest type of the Guide Plate.

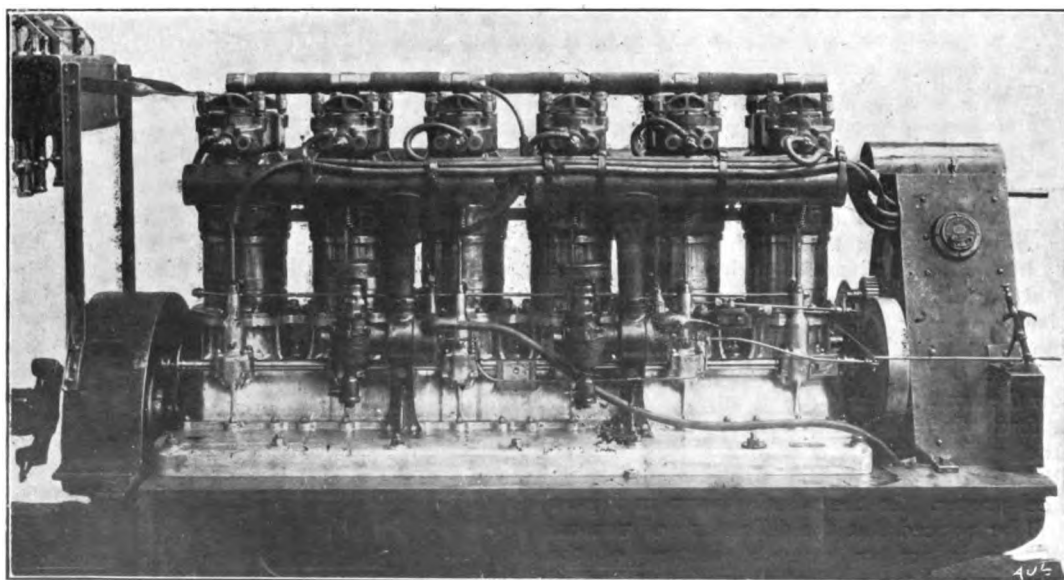
(To be continued.)



A CHIEF CONSTABLE ON AUTOMOBILES AS A NECESSITY.

THE Chief Constable of Lincolnshire (Captain Mitchell-Innes), who is an enthusiastic motorist, told the Standing Joint Committee of the Kesteven County Council at a meeting last week, how extremely useful he found his car in carrying out his official duties. He asked them to increase his travelling allowance to enable him to continue his active personal supervision of the force. He said that his experience of running a motor car had been very satisfactory. He had covered 3,280 miles during last year. His preliminary observations during the first six months—three months by rail and three by motor—led him to the conclusion that too much was left in the hands of the divisional officers. There was a great stagnation in the force. The men had lived very much too long in certain places, and in some cases they had become so familiar with the communities that they were simply paralysed as policemen. He wanted to continue his personal supervision, and his

motor car enabled him to get into the remotest parts of the county. In his opinion to attempt to carry out his duties by rail and hired conveyances would be most wasteful and extravagant as compared with his motoring experiences. They were very badly served by the railway companies in many parts of the county, and it took an extraordinary time to get a comparatively short distance. If he were to adopt this method of travelling he should be a great many nights out, which meant increased hotel bills, and he should spend a great deal more time from headquarters than was actually necessary. He wanted to do his work thoroughly, and an extra grant towards his expenses would enable him to continue the successful experiment of getting amongst his men on his motor car. A committee was appointed to consider the application conjointly with committees appointed by the County Councils of Holland and Lindsey.



A 6-CYLINDER PANHARD-LEVASSOR PETROL ENGINE.—Our illustration shows the new 6-cylinder engine which has been built especially for marine work, and is to be fitted into a motor boat for competing at the Monaco Meeting. It will be noticed that a separate carburettor is employed for each set of three cylinders, that the cylinders are quite independent of one another, and that the valves are arranged on opposite sides. High-tension magneto as well as battery ignition systems are fitted. The cylinders have a bore and stroke of 170 mm., and the power of the engine is about 150-h.p.

THE POSSIBILITIES OF THE PEDRAIL.



THE PEDRAIL TRACTOR DEMONSTRATION AT LIVERPOOL, December 22.—A group of prominent Liverpool men interested in the development of economical transport. A key to the group will be found below.

NEARLY everyone has become more or less interested in the quaint traction engine devised by Mr. Diplock, which walks about on feet, and can even walk upstairs with much of the grace and nearly all the agility of an elephant. Our readers, at any rate, have seen many pictures of this machine, and have already had its construction fully described (January 23rd and 30th, 1904), while its peculiar method of progression formed the basis of a very exciting imaginary war story by Mr. H. G. Wells.

For carrying heavy weights over rough ground and bad roads the Pedrail is unequalled, and the soft, caressing action of its feet rather improve than injure the road surface. It is probably the ideal machine for very heavy loads and rough work, such as getting

siege guns into position, and an experiment with it for this purpose is to be shortly tried in the Long Valley at Aldershot. Recently a Pedrail, carrying a heavy load and pulling two trailers, trudged up from Lincoln to London most successfully, and now a demonstration of its extraordinary haulage capacity has been again made at Liverpool in the presence of many well-known men, an occasion on which the accompanying photograph illustrating the event was taken. Ordinary heavy Pedrails have been designed for a speed of 4 to 5 miles an hour, but Mr. Diplock is now designing a machine to proceed at 8 miles, and believes that he will be able to obtain speeds of 15 or 20 miles an hour by re-designing the present model. Whether this will ever be practicable is an interesting problem.



KEY TO THE PEDRAIL PHOTOGRAPHIC GROUP.

1. Mr. E. H. D. Shaw. 2. Mr. W. C. Thorne, Solicitor to the Mersey Docks and Harbour Board. 3. Mr. G. A. Moore, Director of the Liverpool Corn Trade Association. 4. Mr. J. E. Anderson. 5. Mr. Thos. H. Barker, Secretary of the Liverpool Chamber of Commerce. 6. Mr. A. Lyle Rathbone. 7. Mr. S. Barker. 8. Mr. A. H. Milne, Editor, "Liverpool Chamber of Commerce Magazine." 9. Mr. Danson-Cunningham, Member of the Dock Board. 10. Mr. Anthony G. Lyster, Chief Engineer, Mersey Docks and Harbour Board. 11. Representative of "Liverpool Journal of Commerce." 12. Mr. Miles-Kirk Burton, General Manager and Secretary to the Dock Board. 13. Mr. Charles Lancaster, Member of the Council Chamber of Commerce. 14. Mr. Walter Glynn, Member of the Mersey Docks and Harbour Board. 15. Professor H. S. Hele-Shaw, F.R.S., LL.D., etc. 16. Mr. Robert Gladstone, Chairman, Mersey Docks and Harbour Board. 17. Mrs. Diplock. 18. Mr. B. J. Diplock, Inventor of the Pedrail. 19. Mr. G. H. Cox, Senior Vice-President, Liverpool Chamber of Commerce. 20. Colonel Goffey, Chairman, General Trade Committee Chamber of Commerce. 21. Mr. H. Kerr-Waddell, Member of the Council Chamber of Commerce. 22. Mr. J. C. B. Annesley, Liverpool Cotton Association. 23. Mr. W. Tyson. 24. Mr. Chas. Smith, Engine Driver.

HIGH-TENSION MAGNETO-IGNITION.—PART XII.

(Copyright.)

THE LODGE HIGH-TENSION IGNITION SYSTEM.

ALTHOUGH not yet actually adapted for use with magnetos, the high-tension ignition system we are about to describe will in all probability be used in conjunction with them before long, and in any case a series of articles, dealing with the subject as broadly as does this, would

The phenomena in question are to be observed when a spark is obtained at a gap in an electrical circuit which—in addition to the usual battery and induction-coil—has two small capacity-condensers, or Leyden jars, arranged in it, in a particular way. When the inner coatings of these Leyden jars are charged with electricity, by connecting them respectively to the ends of the secondary winding of an ordinary induction-coil—and their

contents are discharged in the form of a spark, then instantly another spark will take place between the outer coatings of the jars, if these are connected together through a suitable air gap. This latter, or "B" spark—so called by Sir Oliver Lodge to distinguish it from the "A" spark produced by the inner coatings—has the remarkable property of being immune from the evil effects of ordinary faults to which the ignition-circuit is liable. In fact, so much partiality does such a spark evince for jumping its proper gap, that it

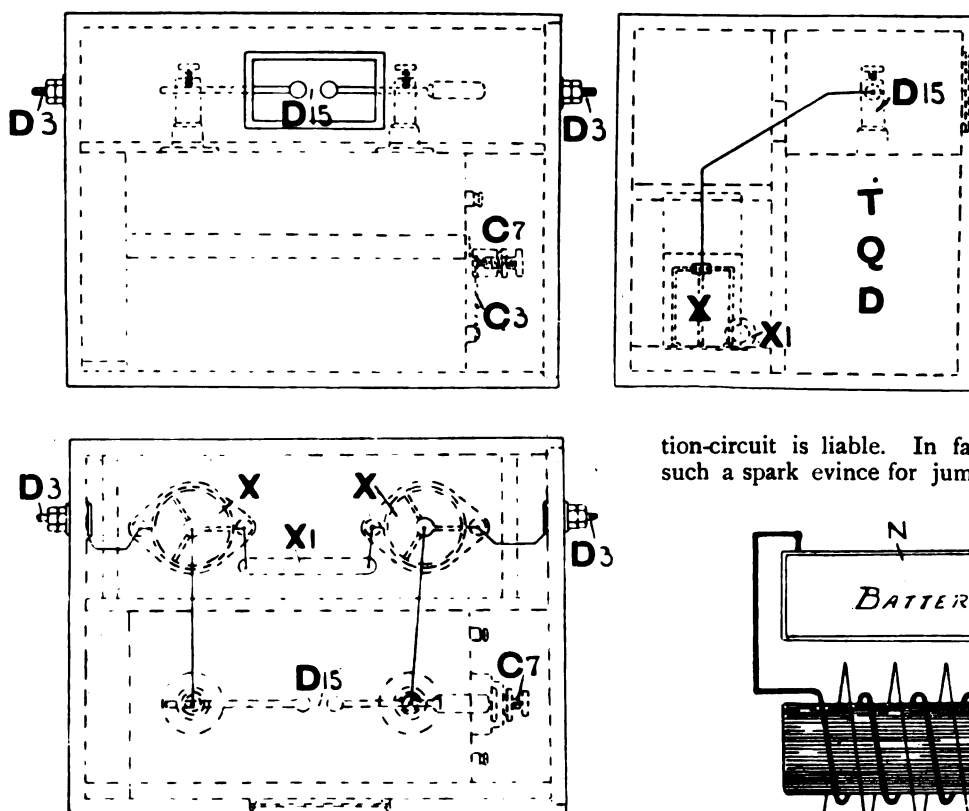


FIG. 31.—The Lodge High-Tension Ignition.—Outline drawing of the Apparatus, showing general arrangement of the principal parts.

hardly be complete without some reference to the ignition system associated with the name of Sir Oliver Lodge. Some entirely different principles are involved in this form of ignition, which has been designed with a view to minimising the effects of inefficient insulation on the ignition-plug circuit. As is well known, a very small fault in the insulation of the secondary or high-tension wire is fatal to the efficient working of an ordinary plug, while damp on the porcelain, or carbon deposit between the spark-points, are still more likely causes of trouble to motorists. It would appear almost paradoxical to suggest that it were possible to eliminate the effects of such faults as these, without resorting to the use of some low-tension system, and it has been left to Sir Oliver Lodge to apply to the practical solution of this problem the phenomena to which he had—some years previously—paid particular attention, and to which he was mainly responsible for attracting the attention of the electrical world.

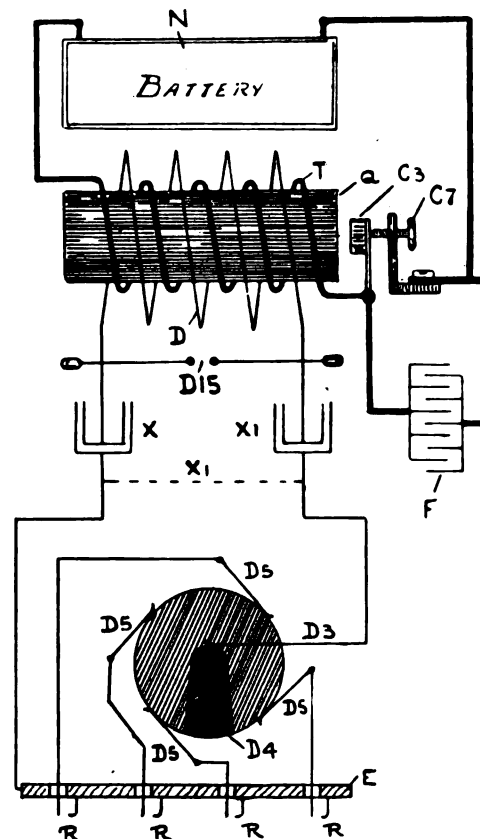


FIG. 32.—The Lodge High-Tension Ignition.—Diagram of Connections.

is indifferent both to damp and to any ordinary carbon deposits.

We are not able to give any complete illustration of the apparatus, nor are we as yet at liberty to publish photographs showing the constructive details included in the "Lodge coil," of which, however, we give a line drawing in Fig. 31. The complete apparatus—of which some of the principal parts are indicated in outline—is enclosed in a neat wooden case. It consists of an ordinary induction coil—the position of which in the box is indicated by the letters T, D, and Q, to denote the primary and secondary windings and the iron core respectively—fitted with its trembler, C³, and adjustment screw, C⁷, an adjustable spark gap, D¹⁵, which is connected across the secondary winding, D, and a pair of Leyden jars, X, the outer coatings of which are electrically connected together through a partial conductor, X¹—termed the "leak."

Fig. 32 is a diagram of the electrical connections, prepared so as to be uniform with our previous diagrams, in order the more readily to indicate the differences between this and other high-tension ignition systems. So far as they apply, the same reference letters have been used, and it will be noticed that, up to a point, the system is identical with the ordinary high-tension system fitted with a trembler coil. This similarity is, in fact, so far complete that there is even the secondary spark-gap, D¹⁵, which in ordinary circuits is represented by the ignition-plug, R. The secondary spark in the "Lodge" ignition is not, however, used to ignite the charge, although the ignition in the engine is indirectly dependent upon it. It is, instead, the "B" spark, already referred to, that actually occurs inside the cylinder, and the immunity from the evil effects of faults, thus conferred upon the ignition circuit proper, coupled with the isolation of the still delicate secondary circuit to a place inside the coil-box, where it can be easily insulated, thus tends to render the system as a whole particularly reliable.

The innovation in the "Lodge" circuit, therefore, consists essentially in the introduction of two Leyden jars, X, the inner coatings of which are respectively connected to the terminals of the secondary spark gap, D¹⁵, and the outer coatings of which are connected to the ordinary ignition plug. The problem of connecting the outer coatings of the jars so as to enable them to be charged without at the same time short-circuiting the "B" spark and preventing its occurrence, has been solved by the use of a semi-conductor, X¹, of damp blotting-paper enclosed in a glass tube to preserve its moisture.

A Leyden jar is nothing but a particular type of condenser such as is formed by partly coating the inside and the outside of a glass jar with tinfoil. The condenser, as used in conjunction with the primary contact breaker, is, it will be remembered, constructed of several sheets of insulated tinfoil. Such a device would be unsuitable for use in the position indicated by the Leyden jars, X, on account of its relatively large capacity and weak insulation. It has already been explained in our introductory chapters how electricity will flow into a condenser in preference to sparking across an air gap, and it is the same cause which makes the condenser, F, absorb the spark which would otherwise take place between the trembler, C³, and the adjustment screw, C⁷, that also causes the Leyden jars, X, to temporarily absorb the spark which would otherwise occur at the gap, D¹⁵. The capacity of the Leyden jars employed is so small, and the electricity supplied by an induction coil is of such considerable quantity, that, although they have been described as

momentarily absorbing the current, they are nevertheless so quickly charged up to their limit that they themselves discharge through the gap, D¹⁵, instantaneously with the switching on of the primary current. There is, therefore, in effect, no difference between the interval elapsing between the switching on of the current and the occurrence of the secondary-sparks either in an ordinary ignition circuit or in the "Lodge" system; it is a practically instantaneous cause and effect in both cases with properly designed apparatus.

As has been explained, the discharge of the inner coatings of the Leyden jars, X, through the spark gap, D¹⁵, gives rise to an instantaneous discharge between the outer coatings of the jars which are connected to the ignition plug. So extraordinarily rapid are the oscillations of this discharge, and so altogether impulsive is the first rush of current, that the smallest of inductances presents enormous impedance to such a current when compared even with such a high resistance as that represented by the air gap between the spark gap of the ignition plug. The consequence is that a metallic short circuit of even moderate length, to say nothing of the high resistance of the "leak," X¹, presents so much obstruction to this rush of current that it is quite powerless to prevent a spark occurring at the nearest air gap, which will of course—in a circuit constructed with reasonable care—be at the ignition plug sparking points. The immunity of this "B" spark from the evil effects of ordinary faults must be attributed entirely to the extraordinary rapidity of the Leyden jar discharge, which is completed in about the millionth part of a second, an interval of time which may well be termed instantaneous. It is, in fact, about one thousand times shorter in duration than the time occupied by the ordinary secondary spark; that is to say the two sparks may be represented by the ratio of a *second* to a *quarter of an hour*. With such a difference in duration it will readily be conceivable how faults ordinarily sufficient to allow the slower current to leak through, are powerless to entice this lightning-like discharge from the very shortest and quickest path possible. Even damp porcelains, which would be the source of much annoyance with the ordinary system, are perfect insulators for the "B" spark, which will, in fact, take place with unexceptional regularity, even when the whole ignition-plug is immersed in water.

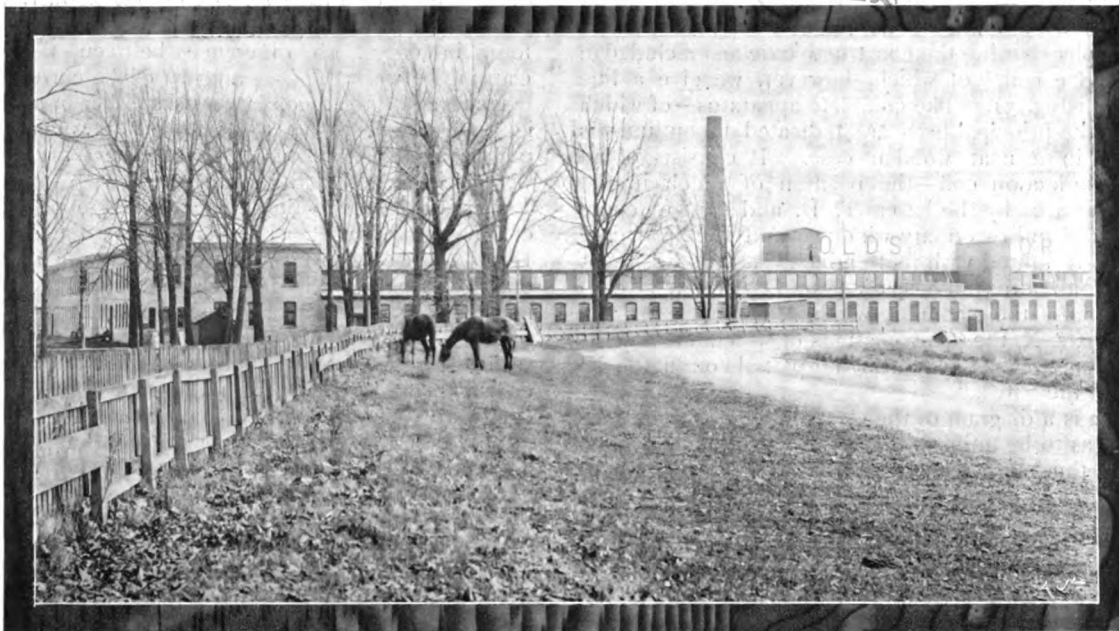
The fact that there are two sparks instead of one is evidence of increased power required, but it is said that this is not of a serious character, and that it does not involve the use of batteries of a larger size than those employed in ordinary high-tension ignition.

Up to the present time, somewhat more attention has been paid to the application of this ignition system to stationary gas engines, and, although it has already developed into commercial form in connection with petrol engines for motor cars, it has not as yet been tried in that direction to anything like the same extent, nor has it, as has already been mentioned, yet been used in conjunction with a magneto.

Table of Reference Letters for the Lodge High-Tension Ignition System.

C ³ Trembler.	F Condenser.
C ⁷ Adjustment screw.	N Battery.
D Secondary winding.	Q Core of induction-coil.
D ³ Feeder wire.	R Ignition-plugs ("B" spark).
D ⁴ Feeder segment.	T Primary winding.
D ⁵ Feeder brushes.	X Leyden jars.
D ¹⁵ Spark-gap for the "A" spark.	X ¹ "Leak."
E Earth.	

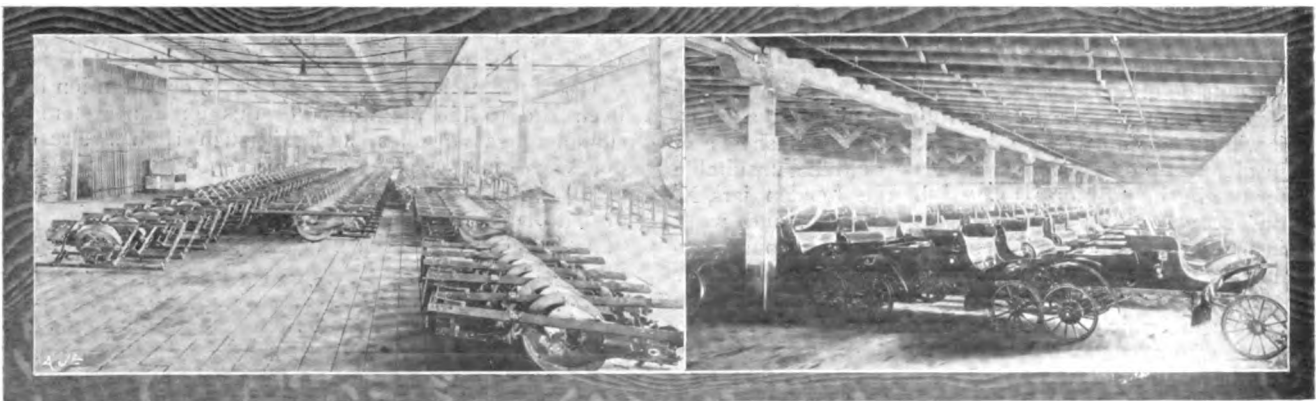
THE MANUFACTURE OF A LIGHT CAR—THE OLDS MOTOR WORKS.



BUILDING A SMALL MOTOR CAR.—The Olds Motor Works. A view of one end of the Works. The pensioned hippomobiles grazing peacefully on the left at the side of the testing track, have little reason to complain of the introduction of mechanical traction.

PROBABLY few people realise the problems which confront an engineering firm when they undertake to manufacture a light car, make it a success, sell it at the lowest possible price, and establish a firm financial basis on which to continue work. Such has been the aim of the Olds Motor Works of America, and the result of their energies is the well-known Oldsmobile Runabout, which is controlled by Messrs. Jarrott and Letts in this country. Of the car itself we have already given fully illustrated descriptions, but we are now able to convey some idea of the factory by the accompanying photographs, for which we are indebted to Mr. W. M. Letts, who procured them, as also the following interesting particulars, during his recent trip to America.

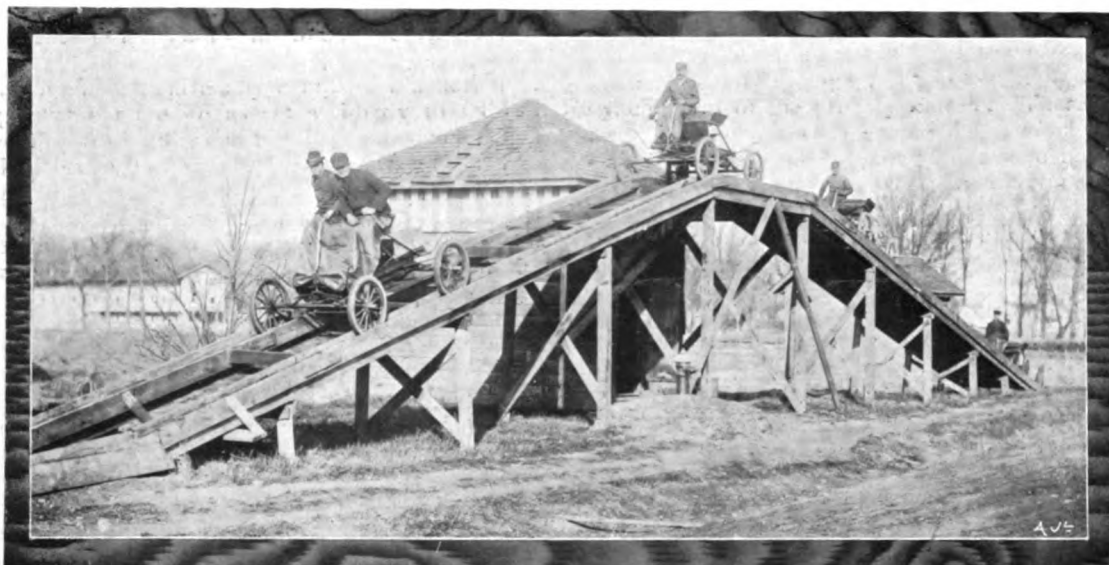
The Olds Motor Works has two large factories, one at Detroit and the other at Lansing, both being in the State of Michigan, although some sixty-eight miles apart. It is at the latter works exclusively that the well-known "Runabout" is manufactured. The Lansing Works occupy land to the extent of 100 acres, this enormous space including, of course, a very large testing ground, where the cars are given their trial runs. When it is realised that this company are prepared to turn out no less than 10,000 cars during the coming year, it will be more readily understood that the work has to be carried out on an enormous scale, and with as much method as possible. The Lansing Works are modern in every respect, they are fully equipped with automatic tools, lit



The stock of engines waiting to be "called for" by the assembling staff.

The finished Car. A stock of 1,000 cars ready for the road.

BUILDING A SMALL MOTOR CAR.—The Olds Motor Works.



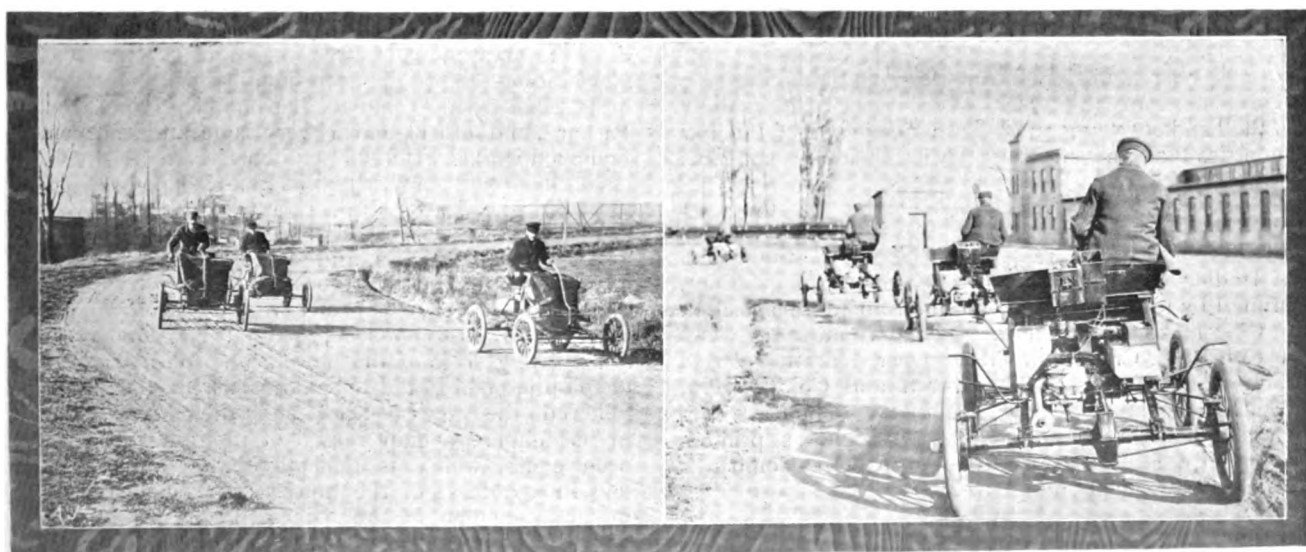
BUILDING A SMALL MOTOR CAR.—The Olds Motor Works. The testing bridge in summer where Oldsmobile cars are required to run up and down, stopping first on the up gradient, again at the top, and once more when descending, so that the holding power of the brakes may be thoroughly tested.

by electric light, and provided with electric travelling cranes. The raw material comes in at one end of the works, and the finished article leaves at the other end, the sequence of operations being so carried out that no piece passes over the same ground twice. The result of all this method is that it is estimated that one Oldsmobile engine is completed every seventeen minutes. There is also a fire-extinguishing system laid throughout the shops, which automatically comes into operation should the internal temperature of the buildings rise above a certain degree.

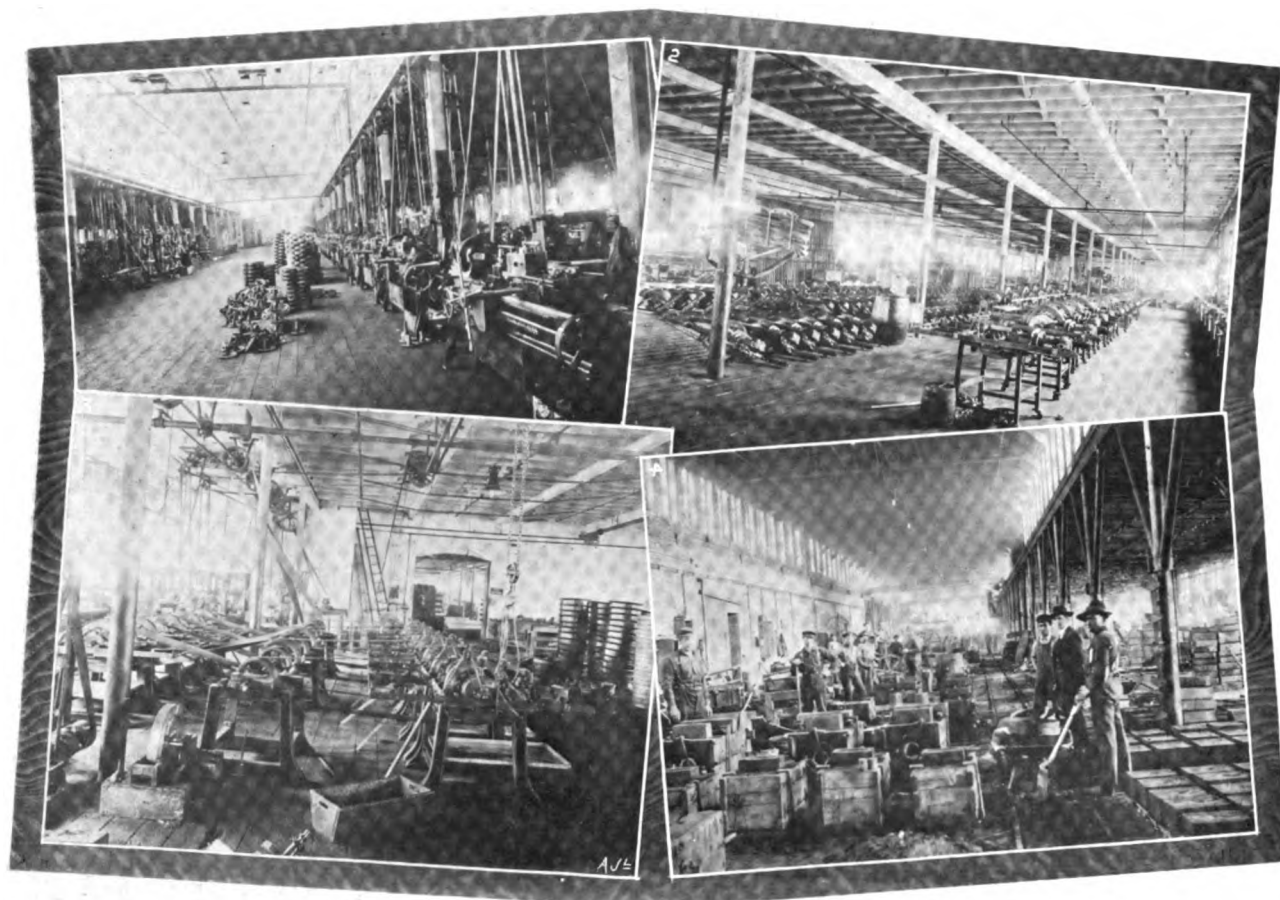
Not the least impressive of the various departments are the enormous stock rooms. In order to prevent delay in the execution of orders, the Olds Company have adopted the very wise policy of manufacturing for stock in the off season, and the result is that they

expect to have no less than 2,000 cars in hand by the end of this month. This stock manufacture is of course entirely independent of the ordinary current business, so that the works are always kept going at high pressure instead of being unduly rushed during the season.

Considering that there is about a mile of frontage to the Olds Works, it is not unnatural that it should be impossible to give a general view of the factory. The accompanying photographs, however, show many interesting departments, in one of which can be seen 1,000 of the complete cars in stock, all of which are already sold for delivery in the spring. Some of the other views are taken of the cars in the running ground, every car being carefully tested before leaving the works. In one part of the track is a "test hill" having a gradient of 1 in 3, on which the cars have to stop and restart as they



BUILDING A SMALL MOTOR CAR.—The Olds Motor Works. Testing cars for speed and regular running on the private outside track.



BUILDING A SMALL MOTOR CAR.—The Olds Motor Works. 1. One of the machine shops. 2. One of the assembling and engine stock rooms. 3. Engines being run from the shafting for "bedding in" purposes. 4. The foundry.

go up and down. Unfortunately, the American winter is accompanied by so much snow that out-door testing is impracticable in those months; a winter testing house has therefore been obtained by the purchase of a disused enclosed bicycle track in which the cars can be tried when the weather is so severe that the outside track is unavailable.

It is characteristic of American methods that the management of the Olds Works is almost entirely in the hands of young men. America is one of the few countries that is not afraid of allowing their large concerns

to be run by the best men, irrespective of age, looking rather at results than at credentials, and considering that commercial success is not discounted by lacking the dignity of mere age. Mr. Letts concludes his remarks by referring to his impressions of the American automobile industry generally, and finds that there are many signs of rapid improvement having taken place during the last eighteen months, many of the best firms, such as the Cadillac, Locomobile, Pope-Toledo, Packard, and others, having very large and excellently equipped works.



Heavy Motor Car Regulations.—In the views of leading engineers concerning these new regulations, printed by us last week, by an unfortunate transposition in the "make up" of the matter, a portion of the views of Col. R. E. Crompton, C.B., appeared at the end of the remarks of Messrs. Thornycroft and Co. instead of over the signature of Col. Crompton. The three concluding paragraphs on page 51, which, as printed, apparently form part of the Thornycroft Company's article, commencing respectively

"As regards the speed regulations," &c.

"Summarising, it appears that," &c.

"Although it is of the utmost importance," &c.

should be transposed to page 50, before the signature of Col. Crompton.

The Great Dailies and Automobilism.—It is a satisfactory sign of the times that one after another the leading daily newspapers have introduced a column devoted to automobilism, particularly the popular and sporting sides of the movement. With its change of proprietorship, the *Standard* has, in this respect, followed the general lead, and there now appears in its columns a daily record of motoring events and occurrences, which is generally both well informed and fully abreast of the times. The inclusion of a motoring column in the daily papers is a recognition of the growing general interest in the automobile movement, and is also sure to have the effect of benefiting the automobile press by introducing the subject to an ever widening circle of the public.

THE FIRST YEAR'S WORKING OF THE MOTOR CAR ACT.*

By A. Moresby White, Barrister-at-Law.

THE object of the Motor Car Act, 1903, was to remove existing restrictions upon the use of light locomotives on highways, and to facilitate the better identification of any offending motor car. The right to use a motor car on the highway is not a common law right, but depends upon a statutory privilege enabling light locomotives to be used on the highway. It is important to notice that the motor car is a carriage within the meaning of the Highway Act or any other Act of Parliament, and therefore under existing highway law a motor car being a carriage has as much right to the use of the highway as any other vehicle. Under the Act of 1903 there are still considerable restrictions on the use of motor cars; some of these are of a highly penal nature. The rule of law is that all penal statutes, such as the Motor Act, 1903, must be strictly construed, and always in favour of the person exposed to the penalty. In considering the effect of a year's working of the Act it may be useful to take particular instances from its various sections, and show how these have been enforced by the magistrates. Very extensive and novel powers were placed in the hands of the magistrates in Petty Sessions by the Act, and the working of the statute has been almost entirely dependent upon their views of what it means, and how it ought to be administered. They have been to some extent on their trial, together with the Act, and it may be doubted whether they have always administered the Act fairly to motorists. Indeed, many who have had a wide experience of different Courts aver that the working of the Act has been singularly unjust, and has produced a course of conduct in some Benches consistently hostile to motorists.

The Act ought to receive a construction in favour of the accused, and the necessity for carefully considering the exact meaning of every word in the Motor Car Act is well exemplified by Section 1 of the Statute.

The object of Section 1 is to prevent reckless driving, and as a necessary result to protect the public from danger. It contains four separate misdemeanours:—

1. Driving *recklessly*.
2. Driving *negligently*.
3. Driving at a *speed* which is dangerous to the public, having regard to all the circumstances of the case, including the nature, condition, and use of the highway, and to the amount of traffic which actually is at the time or which might reasonably be expected to be on the highway.
4. Driving in a *manner* which is dangerous to the public, having regard to all the circumstances of the case, including the nature, condition, and use of the highway, and to the amount of traffic which actually is at the time or which might reasonably be expected to be on the highway.

Each of these four offences is termed an offence under the Act, the penalty being a fine up to £20, and also endorsement of the licence of the driver. The licence *must* be endorsed for any offence under Section 1, and there is no power in the Court to dispense with the necessity of endorsing the licence.

For a second offence under Section 1 the driver may be sent to prison for a period not exceeding three months.

The appeal against any conviction where the fine is over 20s., or where imprisonment is ordered, lies to the Quarter Sessions of the county or borough, as the case may be. The value of this right of appeal is more apparent than real, for the magistrates at Quarter Sessions as a rule support the views taken by their brother magistrates at Petty Sessions. When the fine is one of 20s. or under 20s. there is no right of appeal. It sometimes happens that the Court will regard the offence as a trifling one, deserving merely a small fine, *e.g.*, 5s. and costs. This is cruel kindness, because the licence is endorsed and there is no appeal. In such cases, if it is at all likely that an appeal may be desirable, the defendant should at once ask the magistrates to alter the fine to 21s.

The proper course in such trifling cases for the Bench to pursue is to dismiss the information without proceeding to conviction, and if necessary to order the defendant to pay a reasonable sum to cover costs. Express power is given to this effect by the Summary Jurisdiction Acts, but it is rarely used.

The four offences in the first part of Section 1 being different, it follows that a summons which charges the defendant with more than one of them is bad and must be amended. The defendant can force the police to elect on which charge they will proceed at the hearing before the justices. If the conviction is drawn up to include more than one offence it is bad, and will be quashed upon *certiorari*, as was done in *Rex v. Wells*, where the motorist was convicted for

driving at a speed *or* in a manner which was dangerous to the public. An important point in the rules of evidence is that in trying to prove one criminal offence you are not entitled to adduce evidence of another criminal offence; therefore, on a charge of driving in a *manner* dangerous to the public, evidence of the motorist going at a dangerous rate of *speed* is, strictly speaking, inadmissible. Again, if the summons is for driving at a *speed* which is dangerous to the public, evidence that the car zigzagged about the road ought not to be admitted.

It is highly important to notice that the real gist of Section 1 is danger to the public. In every charge made there ought to be affirmative evidence of public danger. The penalty imposed proves that this must be so. A car may go at eighteen miles an hour without incurring any punishment, mere speed under 20 miles an hour is no offence; even if 20 miles an hour is exceeded the penalty does not entail endorsement of the licence. It has been contended that the exception in Section 4, of an offence "consisting solely of exceeding any limit of *speed* fixed under this Act," applies to the offence under Section 1 of driving at a *speed* dangerous to the public, and that, therefore, for this offence the penalty of endorsement of the licence is not incurred. I have argued this point in the High Court, but the answer of the Lord Chief Justice practically enforced the necessity of recognising that danger to the public, not mere speed, was the object of Section 1. The *manner* of driving may be dangerous to the public wholly irrespective of the pace at which the motor car is moving.

Strict proof of public danger must be insisted upon in every case. Be it carefully observed for any offence under this section, an Englishman may be sent to prison without having any right to trial by jury. It is most important, where the cherished birthright of an Englishman is taken away, and his liberty placed absolutely at the mercy of any two magistrates sitting in Petty Sessions, that so penal a law should be strictly interpreted by the Bench. Unfortunately, there are counties where an appeal from Petty Sessions to Quarter Sessions upon a question of public danger—indeed, on any point affecting motorists—would be futile.

The words in Section 1, "nature, condition, and use of the highway," are sufficiently clear; "refers to the *quality* of the traffic as distinguished from the *quantity* of the traffic."

The phrase "the amount of traffic which might reasonably be expected on the highway" presents a very serious question. Magistrates frequently read this as enabling them to assume that when a motor car is running at 12 miles an hour on the open road there might be a large crowd of people going to the village feast, or a number of children might be going in or out of school; therefore as persons might be there they think they are entitled to hold that the public have been endangered by the motor car. A car going 6 miles an hour, hypothetically speaking, *might* run into a village party or a band of school children; therefore a conviction *must* follow. But this hypothesis is quite untenable. The best evidence of the traffic which might reasonably be expected to be on the road is found in proving what traffic was actually there at the time in question and at the place in question. Every criminal offence is, broadly speaking, local in place and definite in time; in motor car offences the exact time and place are most important considerations which the magistrates frequently ignore. To suggest that at some other time of the day at the place in question there *might* be a quantity of traffic cannot be evidence of public danger. If the traffic had been there when the car passed then the driving of the car might have been different. The truth is, convictions are arrived at on the assumption that the motorist will pursue the same conduct in any state of facts, whatever they may be.

The magistrates have used Section 1 as an instrument to reduce the speed of motor cars. Speaking generally, they have not made application to the Local Government Board under Section 9 of the Act to limit the speed to 10 miles an hour in their area, nor have they applied under Section 8 to enforce restrictions on particular roads, but they have stretched Section 1 in a manner and to a use for which it was never intended. They seldom require any proof of danger to the public; on evidence of speed being given they readily infer danger to the public, and on mere inference they convict the motorist. Thus, by means of Section 1 the speed of motor cars is reduced to such a limit as in the opinion of the particular Bench is a fit and proper speed, a variable limit entirely dependent upon the fancies of any two county justices. This direct limitation on speed is the result of the way in which the Act is now administered, which I believe to be utterly illegal, and I am confident was never intended by the statute.

(To be continued.)

* A Paper read at the Automobile Club on January 12th.

RACES, RECORDS, AND TRIALS.

Gordon-Bennett Race and the Grand Prix.

The Protest of the Automobile Club.

WE are glad to be able to chronicle that the A.C.G.B.I. has taken the proper and sensible course of formally protesting against the proposals of the French Club to run the Grand Prix and the Gordon-Bennett Race simultaneously on one and the same course. The club, as will be seen by the official communication which we publish below has passed three resolutions, the first two of which strongly condemn the principle of running the Gordon-Bennett Race over the same course and at the same time as any other race, while the third undertakes to send copies of the two resolutions to Mr. Gordon-Bennett and the other clubs interested. This being the case, we trust that when the resolutions of the English club are placed before the other Continental clubs, the result may be to prevent the adoption of the suggested course. We discussed the merits and demerits of the proposal in a recent issue, so that we have nothing further to say on the subject, and these arguments cannot be better summarised than the A.C.G.B.I. has itself done in its communication:—

The President, Automobile Club of France.

SIR,—On the assumption that the report published in *L'Auto*, on December 29th, is a true and accurate report of the decision of the Automobile Club of France—

- (1) To institute a new road competition, to be known as "Le Grand Prix de l'Automobile Club de France."
- (2) That this race should be run over the same course concurrently with the Gordon-Bennett Race, at the end of June, 1905.
- (3) That the conditions governing "Le Grand Prix," as published in *L'Auto*, of the 8th January, are also correct—

the committee of the Automobile Club of Great Britain and Ireland instruct me to forward to you as under, resolutions passed at its meeting held on Monday, the 9th of January, bearing on this subject:—

First Resolution.—That the principle of another race being run at the same time, and over the same course, as the Gordon-Bennett Cup Race will decrease the interest in the Gordon-Bennett Race, and is bad in principle from a competing club's point of view.

Second Resolution.—That this club immediately send to the Automobile Club of France a strong protest against any other race being held on the same road and on the same day as the race for the Gordon-Bennett Cup.

Third Resolution.—That a copy of this protest be sent to Mr. Gordon-Bennett and to the other clubs which are eligible to compete in the Gordon-Bennett Race, with an invitation to them to send a similar protest.

These resolutions were arrived at after long discussion and careful thought, and the committee are desirous of informing the Automobile Club of France of their unalienable support of automobilism as a sport, but, at the same time, they must strongly protest against any attempt being made to lessen the importance and value of the Gordon-Bennett Cup, though they are anxious and desirous to support the French Club in its efforts to promote still another race.

While the committee wish to uphold and support the French Club in every possible way in connection with some such race as the Grand Prix, they feel that it should not be allowed to interfere with the running of the Gordon-Bennett Race by being run over the same course and on the same day, and necessarily, therefore, seriously affecting the issue.

The committee wish to point out that a trophy of such historic fame as the Gordon-Bennett Cup should remain the blue ribbon of automobile sport, as it must not be forgotten that it is largely due to the generosity and forethought of Mr. Gordon-Bennett in offering such a cup that automobilism has reached its present state of high efficiency, both from the commercial and the sporting point of view.

Further, the committee wish to protest most strongly against the new race having been instituted, and conditions formulated, after the entries for the Gordon-Bennett Race had been received and accepted.

I trust, Sir, that the Automobile Club of France will give the resolutions of this club earnest thought and consideration, as it would be a matter of great regret to the committee of the Automobile Club of Great Britain and Ireland to feel that, in this particular instance, it is not able to give the same support to the Automobile Club of France as it has invariably done in the past.

I have the honour to remain, Sir,

Your obedient servant,

J. W. ORDE, *Secretary.*

119, Piccadilly, Jan. 16th.

MATTERS in regard to the running of the Gordon-Bennett Race and the Grand Prix simultaneously on the Auvergne Circuit, were on Wednesday practically in the same position as last week, as the meeting at which the matter was again to be considered officially by the A.C. de France, was appointed to take place on that day. By that time the French Club had received the formal protest from the British Club with which we deal above, and it is possible therefore that the final decision may not even then be arrived at. In the meantime the *coup* whereby the creation of the Grand Prix was announced is creating a certain amount of jealousy in some of the other countries, and Germany already, it is reported, proposes to establish in like manner a German Grand Prix. For the purpose of further popularising the French Grand Prix, the Chambre Syndicale de l'Automobile have offered a 5,000 franc Cup as a prize, whilst the subscription list opened by *L'Auto* for the purpose of providing extra prizes for drivers other than the winner (who takes *L'Auto's* big 100,000 franc prize) is already mounting up to a considerable sum.

REFERRING to the lack of enthusiasm in regard to the French proposals for the Grand Prix and the Gordon-Bennett, which we attributed to the German Automobile Club in our last issue, the German Automobile Club has now officially informed us that up to date they have not been able to take up a definite position in regard to the French proposals, as these proposals have not as yet been *officially* communicated to them. This is particularly the case with regard to the suggestion of running the Grand Prix and the Gordon-Bennett Race at one and the same time, in regard to which no official communication whatever has been made to the German Club.

As already announced, two Wolseley cars have been entered in the Gordon-Bennett British Eliminating Trials, one of which will be driven by Mr. C. Bianchi (so long associated with Mr. Charles Jarrott), who has recently joined the Wolseley Company. The other driver will be nominated later. The cars will be of 100-h.p., with steel frames of channel section, 3 ft. 1 in. wide with 5 ft. 7 ins. space behind the dashboard; wheel base, 9 ft.; track, 4 ft. 7 ins.; rear wheels, 36 ins. by 5 ins.; front wheels, 34 ins. by 3½ ins. The engine will have four horizontal cylinders in line. There will be four speeds forward and one reverse. Transmission will be by Renold's chain to gear box, and side chains to rear wheels.

LONG distance touring trials are increasing in France, in like manner to this side of the Channel. A 7,000 kilometre run is shortly to be started through France.

THE Scottish Automobile Club Reliability Trial has already received such support that it has been decided to proceed with the provisional arrangements. The trial will take place on May 11th, 12th, and 13th next, and the committee are now framing the rules and conditions of the trial, and making arrangements for a preliminary survey of the selected routes.

5,000 Miles Reliability Trial.—The second week of the trial of the 12-h.p. Siddeley car, under the supervision of the Automobile Club, was concluded on Saturday last by a run to Folkestone and back. The week's runs, we learn, have been most satisfactory, not a single involuntary stop having been registered, and despite the heavy condition of the roads the "Continental" tyres ran without a puncture. Close on 2,000 miles have been covered, the journeys during the past week being to Coventry, Marlborough, North Leach, Southsea, Southampton, and Folkestone, Messrs. Sidney Girling and A. E. Sutcliffe as before sharing the driving

2,000 Miles Commercial Vehicle Trial.—On Saturday last the Straker-Squire 24-h.p. petrol-driven omnibus finished its third journey of 100 miles in its official trial by the Automobile Club. The trial started on Thursday last week, when 100 miles was covered on the Oxford Road without an involuntary stop at an average of eleven miles an hour. On Friday the run was to Newbury and back, and the average was twelve miles an hour. On Saturday the route was to Basingstoke, when again a capital run was made.

The official report up to Tuesday last is as follows:—

Thursday, January 12th, 1905.—Oxford Road. Distance 100 miles. The following involuntary stops occurred:—At 31½ miles, stop to tighten loose nut on magneto, 9 mins. At 37½ miles, stop to get in second speed, 10 secs., and the same at 38½ miles, 5 secs. At 48½ miles for examination of magneto, 6 mins. Engine stopped twice on Aston Hill at the end of 61½ miles, 3½ mins., and 61½ miles, 4 mins. Changed plugs in motor house in evening.

Friday, January 13th.—Bath Road. No involuntary stops. Distance 100 miles. Changed one plug in motor house, and disconnected switch from magneto circuit.

Saturday, January 14th.—Exeter Road. Distance 100 miles. One involuntary stop of 7 mins., for loose nut on magneto tappet,



"Red Pointer," driven by his owner, Mr. C. M. Meyers, of Columbus, O., being paced by Mr. T. F. Hathaway and John Shepard, of Boston, on a Stanley Steam Car.

Wind motoring on the beach. A delightful form of travelling on this 18 mile straightway course. This wind motor was invented and constructed by Mr. E. Mills, of Daytona, and is to be seen regularly speeding its course over the hard sands.

ORMOND-DAYTONA SEA BEACH RACE MEETING.—Two forms of popular speeding on these magnificent sands.

on alternate days, and Mr. Leonard Spong acting as the official observer.

The following is the official report from January 10th to 17th inclusive:—

Wednesday, January 11th.—Oxford Road. No involuntary stops. Distance 149½ miles. Vent pipe from crank-chamber bound with tape on account of small crack in pipe, and wired to frame to prevent vibration. Off side front tyre inflated.

Thursday, January 12th.—Portsmouth Road. No involuntary stops. Distance 148 miles. New spring on air valve on carburettor fitted in motor-house.

Friday, January 13th.—Southampton Road. No involuntary stops. Distance 151 miles.

Saturday, January 14th.—Folkestone. Distance 151½ miles. No involuntary stops.

Monday, January 16th.—Margate Road. Distance 151½ miles. No involuntary stops. Accumulators changed in motor house.

Tuesday, January 17th.—Southsea. Distance 148 miles. Total distance to date, 2,233½ miles. No involuntary stoppage.

The off side driving-wheel tyre has now covered 1,970½ miles without trouble, 2,233 altogether.

The near side driving-wheel tyre has now covered 1,392 miles without trouble.

The average mileage of the car per day is 159½ miles run without involuntary stops since January 5th, when wheel slipped on Sun-rising Hill, 1,628½ miles.

at 38½ miles. Split pin in off-side chain, and lost axle cap replaced.

Monday, January 16th.—Oxford Road. Distance 100 miles. Car stopped at motor house on starting to oil a brake which was rattling. In motor house adjusted foot brake; broke and repaired gauge glass in tank.

Tuesday, January 17th.—Coventry Road. Distance 103 miles. No involuntary stops. Total distance to date 503 miles.

Ormond-Daytona Beach Racing.—Although this American meeting does not commence until Monday of next week, already a large number of crack racing men and their cars are at this popular seaside resort, and several are testing their cars, as each low tide gives opportunity, with the object of acquiring any little tricks there may be to learn. During a speed run of this character, Mr. H. Bowden is reported to have covered, on Monday last, with a 90-h.p. Mercedes car, a mile in the American record time of 37 secs., the previous best having been attributed to Mr. W. K. Vanderbilt, jun., last year. Unfortunately Mr. Bowden's time was not officially taken, therefore he must wait for a repetition of his performance during the regular meet before he can be entered as having achieved a record.



A novel and interesting New Year's good wish card issued by the Berliner Illustrations Gesellschaft to their numerous friends throughout the world.

Southport and Motor Trials.—At a meeting held last week of the Southport Highway Committee, a statement was presented showing the net cost of the 1903 trials to the Corporation, amounting to £323. Policing cost £153, and £797 was spent on highways, but of this £500, it was stated, would have been spent in any event. Should a meeting be again held this year at Southport no extra expense would therefore be incurred, unless an alteration were made in the track. Mr. Irving, the Chairman of the Committee, pointed out that in the town generally there was a grave difference of opinion as to the desirability of having the trials at Southport. If any ratepayer protested against the highway being blocked the Corporation would not be legally in a position to sanction the holding of the trials.

Mr. Alderman Griffiths suggested that a committee should be appointed to consider the expediency of inviting the Automobile Club to hold another meeting this year, which was unanimously adopted.

Crystal Palace Exhibition.—In connection with the Anti-Skid Demonstrations to be held during the Exhibition, entered devices will have to be driven a distance of 50 miles on the road in order to show that they are practical ones, and they will then be put through a series of severe tests on a specially-prepared surface in the Crystal Palace grounds. Amongst recent additions to firms who will be exhibiting at the Palace are Capt. Masui, who will show Germain cars, and the Central Motor Car Company, who will stage Ford cars.

Automobile Association of Bengal Reliability Trials.—In connection with these trials, to which we have previously drawn attention and which take place on February 9th and 10th, under the patronage of His Honour the Lieut.-Governor of Bengal, the chief points in the rules just to hand are as follows:—

There will be four classes, viz., Class A for 4-passenger cars costing over £400 in England; B, for 4-passenger cars over £200 but not over £400; C, for 2-passenger cars costing £200 or under; D, for bicycles, with or without forecars or trailers, and tricycles. All cars must have *bona fide* touring bodies and silencers, and prizes, subject to a minimum of seven starters in each class, will be given in each class for reliability, economy in fuel consumption, and general condition after the trial. The Cup given by the Maharajah Kumar Tagore will be allotted for the most reliable car in Classes A, B, and C. The trials will take place over a distance of 200 to 250 miles on two consecutive days, starting from and returning each day to Calcutta. Amateur drivers only can take part, an amateur being defined as any person who is not a paid driver or a mechanic employed in a motor workshop. A minimum speed of 12 miles and a maximum of 30 miles per hour is prescribed for competing vehicles. Cars travelling outside these limits will be disqualified. Reliability will be determined by allotment of marks, and deductions will be made from a maximum of 2,000 as follows:—For each minute a car is stopped, pushed, or assisted, except in control, will be deducted, Class A, 9 marks; Class B, 7 marks; Class C, 5 marks. For tyre troubles, in all classes, 2 marks will be deducted for each minute during which a car is stopped. Thirty marks will be deducted for each tyre deflated on a car when arriving at its destination. A tie for prizes will entail a further trial to decide the winner. Separate rules for motor cycles are to be issued, and entries, which close on January 21st, are 25 rs. for cars, and 10 rs. for motor cycles.

AN Automobile Exhibition is to be held at Rouen in April next.

THE Belgian Circuit des Ardennes is announced to take place on July 30th.

DURING the Liege International Exhibition, taking place from April 15th to October 15th, in which automobiles will occupy a large section, a big automobile week is to be arranged about the end of August, with the approval and assistance of M. Francotte, the Minister of Industry and Commerce. The programme will include a tourist trial, speed races over the kilometre on the flat and on a hill, in addition to a series of events for motor boats on the Meuse.

Two competitions, to promote the use of heavy oil as fuel, are to be organised by *Les Sports*, one for motor cars and the other for motor boats. The commencement of August is the tentative date for these, and the course for both the cars and the boats will be from Paris to Rouen and back, the one by road and the other *via* the Seine. The only fuels permitted will be (1), kerosene; (2), other heavy oils; (3), shale oils; (4), naphthalene or analogous products.

THE WOLSELEY TOOL AND MOTOR CAR COMPANY, LIMITED.

THE extensive works which have for some time been in progress of construction at Adderley Park, Birmingham, for the Wolseley Company are now making rapid headway. The total area which these works will cover is 116,640 square feet. There will be a total of 12 shops, each bay being of 30 feet span, and giving a frontage facing the existing works of 360 feet. The importance of the work can be to a certain extent gauged from the three interesting photographs on this page, which have been sent us by the Wolseley Company. The greatest energy is now being shown to complete the work in order to cope with the large number of orders which the Company have on hand, and as each building is completed it is at once put into active operation. The chief object of constructing these new shops is to undertake on a large scale the design and building of heavy petrol-driven vehicles, either to run on rails or ordinary roads. New machine tools of the latest pattern, and all necessary appliances for dealing with this class of work, have been installed, and already the company have arranged to deliver some of their heavy vehicles to important public bodies within the next few weeks. During a recent visit from the Birmingham Society of Mechanical Engineers, when sixty-five of the members attended with their president, Mr. R. Holliday, the splendid range of tools and the system in use throughout the works was a source of exceptional admiration to the visitors. It will be remembered that in our issue of January 7th we mentioned the damage done by the severe gale to one of the new shops then being erected. The result of the collapse from this cause is seen in one of the photographs which we reproduce on this page.

BOOK REVIEWS.

ALICE IN MOTORLAND. By Horace M. Wyatt. The Car Illustrated, Ltd. Price 1s.

If anybody wants a good laugh he had better get this delightful little volume at once. It is to some extent a parody, and to some extent an adaptation, to the automobile world, of the "Alice" legend. When we say that without anything approaching slavish imitation, the great part of the humour and fun of the immortal originals are retained with special application to the automobile movement, it would be difficult to accord it higher praise. The work is not merely humorous throughout, it is—a quality more difficult to attain—thoroughly witty, and the opportunities offered of hitting out against the enemies of automobilism and the silly manner in which the movement has been hampered by the police, have been utilised with *verve* and ability, although never overstepping the limits of legitimate chaff and good-nature. The only objection to the work is that it is too short, and perhaps there is just a little too much tendency to incite the thoughtless to look upon dogs as even greater enemies of the movement than the police.

LADY DUDLEY, who is well known as a motor enthusiast, has been making great use of her automobile recently in the neighbourhood of Dublin. Recently she ran over to inspect the district nursing arrangements at Roscommon, paying several visits on the way. Among the places thus honoured by her Excellency was, by a curious coincidence, one of name, "Mote Park."



1. Interior of a new erecting shop. In this the good lighting arrangements and exceptional height of the building is specially noticeable.
2. Excavating for the new erecting shop for heavy vehicles. Three bays of the new shops are already in operation and are seen in the background.
3. In this picture is shown the damage done to the new fitting shop by the gale on the night of December 29th. The existing works and factory chimney are seen in the background.

THE WOLSELEY TOOL AND MOTOR CAR COMPANY'S WORKS.

MOTOR CYCLING.

International Tourist Trial of the A.C. Seine et Oise.—We have already given the main points governing the car section of this important French Trial taking place at Versailles from February 18th to 25th next. The rules governing motor cycles have now been issued. Only tourist motor cycles are qualified to enter, all "freak" machines and racers being rigidly excluded. Two categories are created, viz., (1) motor bicycles without weight limit; (2) 2-seated motor bicycles, tricycles, and quadricycles, weight limit 200 kilogs. Machines must carry all the usual accessories and attachments, such as mud-guards, pedals, silencers, &c. The course will be over a distance of about 1,400 kiloms., divided into fourteen stages of 100 kiloms. each (two stages per day spread over seven days), starting from and returning to Versailles, February 22nd being a day of rest. Only actual constructors of motor bicycles or their agents can enter machines, and only three machines of the same make can be entered in each category. Entries close on February 1st, the fees being for Category 1, 50 frs., Category 2, 75 frs., which includes insurance against fire in the Versailles garage. In special cases where entries are accepted after February 1st, the fees will be doubled. The price of the machines must be declared, and an undertaking given to sell to the public at the declared price. The usual regulations in regard to supervision and the noting of repairs will be enforced, and the awards for regularity in running will be determined by deductions for stops, &c., from a maximum of 1,400 points. Speed on hills will be decided by the allotment of fifty points to machines surmounting the test hills without assistance or pedalling.

Other points will be allotted as follows:—

For comfort, which will include suspension, ease of starting, silence, fuel carrying capacity, &c.—Cat. 1, 100 points; Cat. 2, 200 points.

Position of the engine and mechanism.—Cat. 1, and Cat. 2, 800 points each.

Carrying capacity for accessories, baggage, design of the machine, &c.—Cat. 1, 75 points; Cat. 2, 150 points.

Selling price.—Cat. 1, 25 points; Cat. 2, 50 points.

Total for Cat. 1, 1,000 points; for Cat. 2, 1,200 points.

Moto-Cycle International Cup.—The Austrian Motocyclisten-Vereinigung, who have the selection of representatives for Austria for this race, have determined to hold an Eliminating Trial for selecting two of their representatives, the first place having been

allotted without trial to the firm of Laurin and Klement, as they were the only manufacturers who last year responded to the invitation of the Association to take part on behalf of Austria in the International Race at Dourdan.

Auto-Cycle Club of France.—It has been decided by this club that Paris to Bordeaux is not a sufficiently severe test for machines entering for the Motor Cycle Endurance Test for 1905. They have therefore determined that this year the course shall be Paris, Dijon, Lyon, St. Etienne, Avignon, Marseilles, Narbonne, Toulouse, Limoges, and Orleans back to Paris. The trial will start on May 4th, and last until May 12th. Times will be taken over several measured kilometres both on the flat and on hills, and points will be allotted for each of these, the machines being classed according to the total of these points. Different categories will be created according to cylinder capacity and the number of seats. This new "tour de France" is only open to commercial tourist machines.

New Regulations for Mechanical "Pacers" in France.—The authorities controlling track racing have decided to check the continued use of the monstrosities hitherto used as "pace-making" machines in record-breaking speed trials, and have drawn up a set of regulations governing the future admission of such machines for this purpose. The machines, in running order, must not weigh more than 75 kilogs. and the width of the rear hub must not exceed 30 cms., the pulley being limited to 6 cms. in width. Tyres must be at least 85 mm. wide, and no part of the machine must project behind the rear-wheel except the wind shield, which must be 40 cms. wide. The handle-bars must not come further back than the front of the rear-wheel, while the foot-rests must never be behind the handle-bars. The saddle must be of leather and not more than 20 cms. wide, while its position must be above the level of the rear-wheel hub.

Among other details in these regulations is one relating to the clothes worn by the "pacers." Leather jackets of uniform pattern must, it is now ordained, be worn buttoned during the race, and although waist measurements may be compensated for, within limits, by the use of padding, those whose jackets are too long must sit on them rather than let them trail behind to form a wind shield.

A CUP for motor bicycles, value 1,200 francs, has been offered for tourist machines to be run in a contest in May next at Marseilles over a distance of 300 kiloms. in one stage.

MOTOR BOATING.

Calais-London Motor Boat Race.—There appears to be very little in the rumour recently started in France that this race would after all not take place, judging by the progress being made in regard to the arrangements on this side of the Channel. The A.C.G.B.I. propose that the finish should be at Gravesend, as being a well-known yachting centre, and arrangements are proposed for subsequently mooring the boats off Westminster for the night. The Gravesend Town Council is also co-operating with spirit to help towards making a success of

the event. A fitting municipal entertainment to the owners and engineers of competing craft and guests invited to follow the race is to be offered.

In June, during the great horse week in Paris, a race meeting for motor boats on the Seine is to be organised. The course will probably be between the St. Cloud and Suresnes Bridges. Speed mile and kilometre trials will be the features of the event, in addition to a big handicap race.

NEW ZEALAND is evidently a coming field for the employment of automobiles. Recently we heard from a correspondent of one firm in New Zealand who had alone sold during the past ten months ten Wolseley cars, and generally a number of enquiries in the Colony are being made. We have just received the following extract from a letter from Messrs. J. Chambers and Son, Limited, of Auckland (the agents for De Dion Bouton, Limited), which conjures up visions of more exciting experiences in getting about the country on an automobile than those, used to the smooth running on the good roads of Great Britain and the Continent, are accustomed to:—

"The 12-h.p. De Dion car did admirable work, both on the hills and flat country. We had to climb over the Rimutaka Ranges, and

ascend about 2,000 feet in 6 miles, and descended a similar height in 7 miles on a rough surface, the grades varying from 1 in 6 to 1 in 10. We also had to climb the Pikakarake Hill, a height of 3,000 feet, in 6 miles, up a road barely wide enough for the car itself, and a very dangerous road, there being a precipice on one side of the hill of a depth of several hundred feet.

"We were also very successful in crossing river beds, several of which were in flood. In one place we crossed a river 300 yards in width, the depth of water ranging from 18 inches to 2 feet, and in one place it was 2 feet 6 inches, which was right into the bed or floor of the car, and we went through these rivers without any mishap or the engines stopping. The water level was within about 3 inches or 4 inches of the air inlet pipes, and we are quite sure that there is not another car in the colony that could have got through this, specially as the water was not standing, but was running through like a mill race, and it was all we could do to keep on the ford, and at the same time it was raining and blowing a howling gale. In fact there has not been such a flood in the district for over twenty years."

CLUB DOINGS.

Ladies' Automobile Club.—At the committee meeting on the 10th instant, the following ladies were elected to membership of the club:—Mrs. Harold Browne, Mrs. Lawrie Johnstone, Mrs. Bertram Meeking, Mrs. Micklethwait, Mrs. Waller, and Mrs. Wrohan.

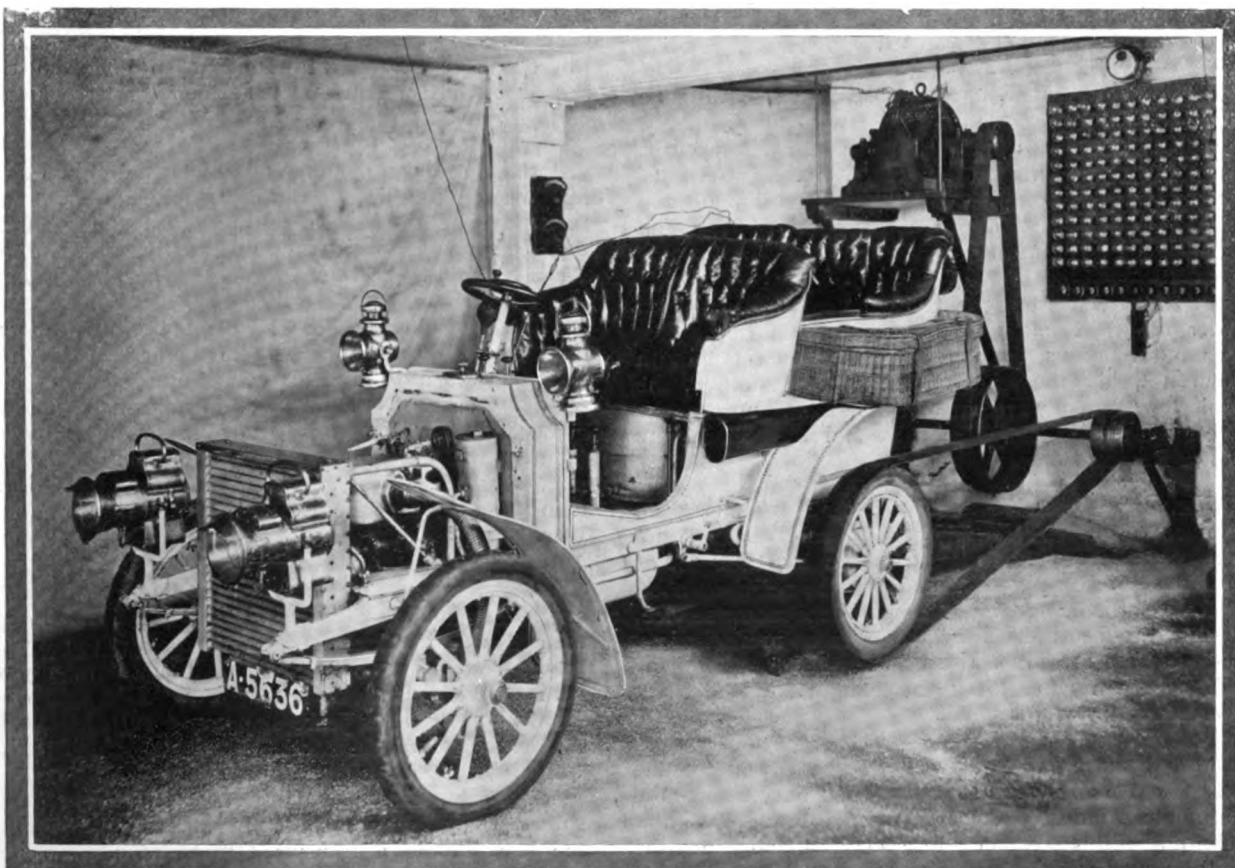
ARRANGEMENTS have been completed whereby the members of the Ladies' Automobile Club can now have the same facilities for taking their cars abroad as have the members of the A.C.G.B.I. This privilege is specially welcome at the present time, as many members of the club are going to the South of France, with their cars, for the remainder of the winter. The club triptyques—which can be had upon application to the secretary of the Ladies' Automobile Club—will obviate the necessity of an unpleasant wait at the French Customs.

THE Annual General Meeting of the Yorkshire Automobile Club will be held on Thursday evening, January 26, at 8.30 p.m., in the club room, at the Great Northern Hotel, Leeds, when the election of officers and committee for the ensuing year, and the passing of the balance sheet, will be the principal business to be transacted.

Proposed Sussex County Automobile Club.—A meeting of Sussex automobilists has been convened by the Motor Union for Saturday, January 28th, to be held at the Old Ship Hotel, Brighton,

at 3 o'clock. The purpose of the meeting is to form a county automobile club for Sussex. There has been a strong feeling in the county for some time that it is very desirable that an organisation of this character should be brought into being. The Motor Union was requested to take the matter up, and has made the necessary preliminary arrangements. There is little doubt as to the success of the meeting. Among those who have already intimated to the secretary of the Union their intention of supporting the proposed club are the following:—Major R. C. Turnor, Capt. J. G. R. Homfray, Messrs. B. Y. Bevan, A. M. Singer, J. Lereculey, E. G. Cundy, E. G. Miller, H. G. Stringer, Capt. F. D. Lyon, and Mr. Alderman Buckwell, of Brighton; Messrs. J. J. Hissey and H. T. Vine, of Eastbourne; the Right Hon. Earl Russell and Messrs. Wm. James and M. F. Mievile, of Chichester; Messrs. Edgar Soames, J. Godwin King, and E. M. Crookshank, J.P., of East Grinstead; Messrs. C. J. Lucas and A. S. Dickens, of Horsham; Dr. Chas. Ormerod, and Mr. S. H. Norman, of Burgess Hill; Capt. Gerald Spencer, of Lewes; Mr. G. Hennessy, of Haywards Heath; Mr. R. S. K. Eyre, of Crowborough; Mr. Boyle Lawrence, of Bognor; Messrs. H. S. W. Eyre and C. F. Frowd, of St. Leonards-on-Sea; Sir James Duke, Bart., of Laughton; Mr. W. Bramson, of Arundel; Mr. N. Leslie, of Henfield; Mr. Arthur Biden, of Cooksbridge; and Mr. F. A. Potts, of Wadhurst.

Any car owners in Sussex who have not yet put themselves in communication with the secretary of the Union are advised to write to 16, Down Street, Piccadilly, London, W.



TESTING A WHITE STEAM CAR.—The White Steam Car Company have sent us the above picture which is of interest as showing their method of testing cars before they leave their London premises. The car is "packed" up so as to leave the rear-axle free to revolve, and the driving road wheels are coupled up to a countershaft by belts. Another belt passes from the countershaft to a dynamo carried by a bracket overhead. The dynamo is connected to a battery of lamps—seen on the extreme right of the above photograph—by which the load can be varied, and the exact electrical output of the machine is measured. The power required to drive the dynamo in this manner has, of course, been ascertained, so that a very ready test of the capabilities of the engine on the car is thus available. No car is passed as satisfactory until the engine on it is capable of lighting to their full value a certain number of lamps which has been fixed as a minimum.

"CARBURETTORS and Petrol" was last week the subject of a lecture by Mr. J. Montgomery, of the Peterborough Motor Company, at a meeting of the Northants Automobile Club.

BETWEEN Ipswich and Yarmouth, a distance of over 50 miles, it is announced that an hourly motor omnibus service is to be run with a uniform fare, from point to point, of 1*d.* per mile.

SIR ALFRED HARMSWORTH, BART., left London on Monday last for a motoring tour through Spain, the South of France, and Italy. Sir Alfred will probably be away about six weeks.

A MOTOR car mail service has been established between Sunderland and Newcastle. The vehicle used is one built by the Enfield Company, of Redditch, for Messrs. Turvey and Co., of Sunderland.

DR. W. R. ORMONDY will lecture to the Scottish Automobile Club (Western Section) on Monday, January 23rd, on "Motor Fuels," with special reference to those of home and Colonial manufacture.

AMONGST new members elected to the A.C.G.B.I. are Earl de la Warr, Sir Everard P. S. Pauncefort-Duncombe, Bart., Major the Hon. E. Stuart St. Aubyn, Hon. Charles E. Craven, Capt. James D. McLachlan.

MOTOR bicycles and ordinary bicycles are both liable to side-slip, and the result is often more disastrous in their case than in that of motor cars. All cyclists, therefore, will learn with satisfaction that the Cyclists' Touring Club is offering prizes, to the value of 200 guineas, for the best means of preventing side-slip on bicycles as at present in use.

THE Wolseley Motor Car Company have taken an order from the London General Omnibus Company for six motor omnibuses, which will commence service with them towards the end of March. In addition, the Wolseley Company are completing similar 'buses for the Great Western Railway Company and the Birmingham Motor Express Company.

WHILE the Great Western motor car service has been "improved off" the roads by the Cornwall District Councils, the Midland Railway are developing their motor omnibus service very considerably. The neighbourhood of Leicester is being largely tapped by the motor service, designed to feed the railway and open up rural districts, and we trust the enterprise of the Midland Company will meet with better treatment than that of the Great Western Railway.

MR. BERNARD BOVERTON REDWOOD, who for the past few years has been so intimately connected with the automobile industry through various firms, has now relinquished his commercial associations and joined the well known firm of consulting engineers, Messrs. Jacobs and Barringer, of 78, Gracechurch Street, E.C. Mr. Redwood will take charge of the automobile branch of the business, and will be open for consultation professionally in the selection of suitable machines for individual requirements by those who at present are not sufficiently versed in motor cars to rely entirely on their own judgment.

A NEAT and well-designed calendar for 1905 is to hand from John I. Thornycroft and Co., Ltd., the well-known engineers and motor car builders.

THE Birmingham postal authorities have contracted with the Wolseley Company to maintain a motor mail service between Warwick and Birmingham. For this service, which will come into operation on March 1st, two special vans have been constructed of 12-h.p. each. These will normally carry a load of about one ton weight at a speed of from 16 to 18 miles an hour.

THE North London Tramways are proving useful evangelists for the automotor, the glorious muddle to which they have reduced the traction with which they are assumed to cope having led the Shoreditch Borough Council to request the London County Council to consider the possibility of adapting a system of automobile tramcars propelled by internal combustion engines. Our constant advocacy of this reform appears, therefore, at length to be bearing fruit.

THE Paddington Borough Surveyor has been to some extent rousing the apprehensions of his ratepayers by declaring that the new traffic regulations would, by allowing heavier and faster vehicles on the roads and streets, tend to detrimentally affect underground pipes and mains. There is little ground, we think, for this view, as the vehicles sanctioned by the new regulations will not have nearly as prejudicial an effect in this respect as the traction engines which we have always had with us.

THERE has been so much talk about the motor trade tending to injure the horse trade, in spite of the repeated proofs that have been brought forward to the contrary, that an interview which a representative of the *Daily News* recently had with Mr. Walter Wolsey, the manager of Tilling's, comes in appropriately. Mr. Wolsey seems to think that in spite of the large number of 'bus horses that will be thrown out of work in the near future, there will always be a demand for horses, and seems to be of opinion that just as the railway companies have been the greatest developers of horse traction, so the motor car industry will probably have a similar effect. At any rate, says Mr. Wolsey, horses have never been dearer than at the present time, except during the South African War.

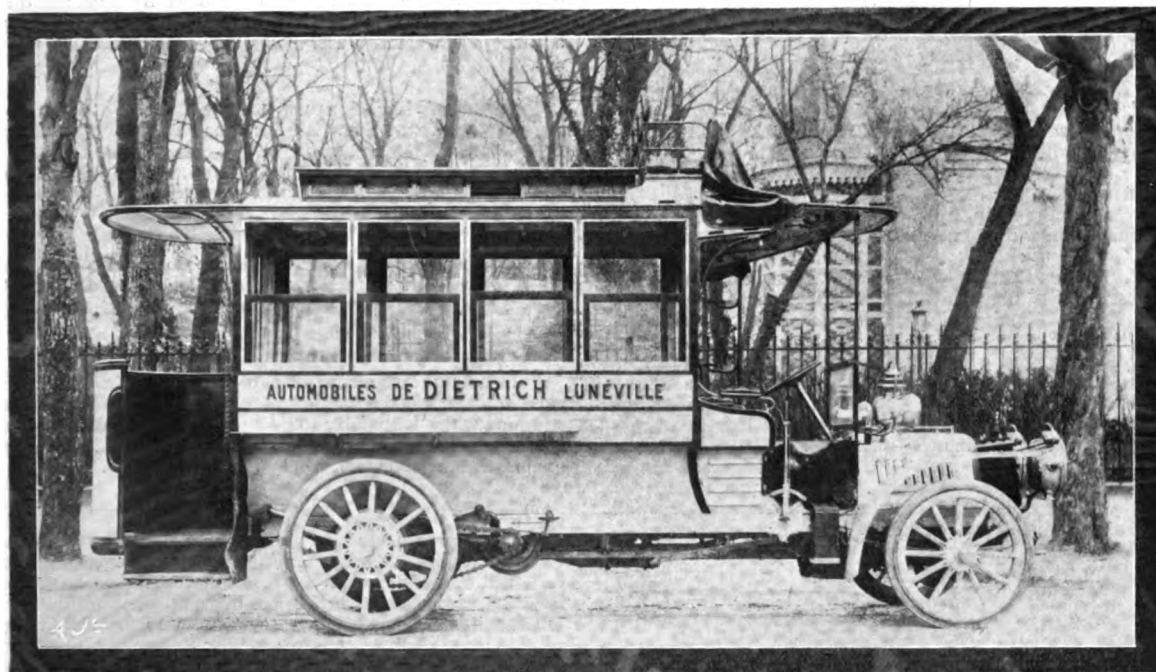
LEEDS has proved itself to be the only large provincial city in England which has applied to the Local Government Board to limit the speed of motor cars to ten miles an hour within its boundaries. The usual inquiry was held on Wednesday in last week at the Leeds Town Hall, when Mr. Rees Jeffreys appeared on behalf of the Automobile Club, the Motor Union, and the Yorkshire Automobile Club, and the Town Clerk and Mr. R. E. Fox for the City Council. The evidence adduced showed the usual absence of any real ground for making the demand, and it transpired in the course of cross-examination that the main object of the Leeds authorities in asking for the ten-mile limit was that they thought that if it were granted, the evidence of one policeman would be sufficient to obtain convictions for exceeding *that* speed limit. The fact that this admission was practically made ought, one would think, to have a considerable effect on the Local Government Board in deciding upon the application.

THE automobile continues to make satisfactory progress in Egypt, and its southern dependency, the Soudan, one of the latest acquisitions made by the latter country being a 24-h.p. Wolseley wagonette, which has been supplied to the War Office, for the use of the garrison at Khartoum. The vehicle has been specially designed for use in a warm climate, and is adapted to work on ordinary paraffin oil. It is fitted with road wheels of unusually large diameter, provided with solid tyres, and special flanges to enable them to travel over the desert sand.

MESSRS. RAPHAEL TUCK AND SONS have sent us a number of their picture postcards, executed by their "Oilette" process, of celebrities of the motoring world, amongst them being H.M. the King (at Lismore) and Mr. A. J. Balfour. The colour effects obtained by this

amiliar. The record run, too, made by Mr. Sangster in September last with an Ariel Car from Land's End to John o' Groat's, is also illustrated by photographs, and the whole adventure is described at considerable length in verse suggesting a combination between "John Gilpin" and Lord Macaulay's "Lays of Ancient Rome." The book includes a certificate given by Mr. Urry, who accompanied Mr. Sangster throughout the run as honorary Observer.

DURING the discussion on Mr. Moresby White's interesting paper, at the Automobile Club, on the working of the 1903 Act, Earl Russell made merry over the case of the magistrates who refused even to believe a bishop. "How," asked Earl Russell, "could they then expect magistrates to believe anyone?" We might add, "except the police!" Following Earl Russell, Mr.



The recognition of the importance of motor omnibuses has been slow in coming. Within the last few months, in all directions, an enormous change has come over the scene, and to talk motor omnibuses to commercial men is a sure way of at once obtaining a hearing, whilst from the slight and satisfactory experience of the general public within the last few months, no more popular subject can be found with the "man in the street" who looks forward to the rapid travelling all the time in the near future, which at present can only be obtained in very diluted quantities, owing to the very few mechanical omnibuses at present plying for custom. For some time the De Dietrich Company have been building motor omnibuses which have, on the Continent, given a good account of themselves under varying conditions. Recently they have elaborated this department, and are now greatly extending their work in this direction, to include also heavy luries and delivery vans. In the above photograph we show the first of a number of finely built machines which are destined for the Colonies.

process are really extremely beautiful, and will no doubt be adopted for illustration on a large scale with equal success. In the meantime the motoring picture postcards will be thoroughly appreciated by all automobilists who desire thoroughly pretty mementoes of this kind to send to their friends.

THE Ariel Motor Company have just sent us a tastefully got up pamphlet designed to celebrate the achievements of their car. The little book, which has a handsome and original cover, tells once more the story of the ascent of Snowdon, which was described in the AUTOMOTOR JOURNAL, and reproduced some of the photographs with which our readers have become

Staplee Firth gave the interesting information that the opinion of Mr. Horace Ivory, K.C., has been taken on the subject, and that he has unhesitatingly stated that motorists warning other automobilists of the existence of a police trap cannot be regarded as obstructing the police in the execution of their duty. This opinion is of interest and importance when we call to mind that Mr. Bernard Redwood was not long ago fined for this identical alleged offence.

THE AUTOMOTOR JOURNAL Stand at the Birmingham Automobile Show, commencing to-day, Saturday, and closing on January 28th, is No. 36.

CORRESPONDENCE.

To the Editor of THE AUTOMOTOR JOURNAL.

DELHI-BOMBAY TRIALS.

SIR,—*Re Delhi-Bombay Trials.* I notice a correspondent of yours suggests that the fact that the Napier car finished first in each day's run of these trials, and kept up the best average speed within the limit set out by the rules of the trials, is not of interest to the British industry, and is misleading. I cannot follow your correspondent's argument.

I am perfectly certain if the foreign car in which he is interested had achieved the same honour as the Napier, we should have heard of it, and I can see no objection in the British industry having credit for facts which redound to its credit.

I enclose you copies of cablegrams which I have received from Mr. Johnson almost daily, and which, I think, clearly bear out my contention.

Yours truly,
S. F. EDGE.

January 14th.

(Enclosure.)

Copies of Telegrams received from Mr. Johnson on Delhi-Bombay Trials.

Agra, December 26th, 1904.—"Arrived first. Non-stop.—JOHNSON."

Gwalior, December 27th, 1904.—"Arrived first. Full marks. Best average speed.—JOHNSON."

Goonah, December 28th, 1904.—"Arrived first. Best average time.—JOHNSON."

Naksi Camp, December 29th, 1904.—"Arrived first. Best average time. Only stop one and quarter minutes yesterday.—JOHNSON."

Gatpuri, January 1st, 1905.—"Friday, Saturday, Sunday, no stops. Best average time from Delhi. Total stops minute and quarter. Dinner Monday night Tajmahal Hotel, Bombay.—JOHNSON."

Bombay, January 3rd, 1905.—"No stop Monday. Best average speed Delhi-Bombay. Astonishment and dissatisfaction throughout India, Judges awarding Gaikwar's Cup to Dietrich, which lost 58 marks and had 88 minutes stoppage. Napier only lost two marks, stopping one and quarter minutes.—JOHNSON."

Bombay, January 5th, 1905.—"Five inexperienced Indian residents acted as judges. Utterly disregarded marks lost for mechanical water troubles, &c., during trials. Gave prize Dietrich though eleven cars held better marks. Judges give no reasons.—JOHNSON."



COMMERCIAL POINTS.

The Motor Manufacturing Company (Limited).—The receiver and manager of this company has removed his London offices and showrooms from 95, New Bond Street, W., to 151-3, Wardour Street, Oxford Street, W., where there are on view a large number of M.M.C. cars of all the latest patterns. The works at Coventry are being carried on, and orders for cars, motors, spare parts, accessories, repairs, and storage of cars receive careful and prompt attention. It is hoped that arrangements will shortly be made to carry on the M.M.C. business in the future, but in the meantime owners and prospective purchasers of M.M.C. cars may rest assured that their orders will receive prompt and careful attention either at the London showrooms or at the Coventry works. We are informed that large numbers of these cars are still coming through the works. The new models are fitted with a new type of sliding-sleeve change-speed-gear driving direct on the top speed.

IN connection with the 5,000 Miles Reliability Trial, under the supervision of the Automobile Club, of the Siddeley 12-h.p. car, the Continental Caoutchouc Company, whose tyres are fitted to the wheels, write us that they have noted that in some of the papers punctures were reported. This, they inform us, is absolutely incorrect, and, considering the present conditions of the roads, they have done remarkably well. Up to Saturday last the car had run about 2,000 miles, and the only trouble experienced was the pinching of one tube, owing to the carelessness of the mechanic who fitted it.

MR. C. H. SCHOFIELD, who has been for the past two years closely allied with Mr. D. M. Weigel in connection with the British

Automobile Commercial Syndicate, Limited, and Clement-Talbot, Limited, has, we understand, resigned his position, and is seeking fresh fields for his energies.

AT the Coventry dépôt in Gosford Street of United Motor Industries, a licence for the re-sale of motor spirit has been taken out. This company is now in a very fine position with their complete stock of accessories, lubricating oil, &c., to cater for touring automobilists passing through "the city of the three spires." Another speciality of the Coventry dépôt is re-charging accumulators.

WE have received a copy of that useful little guide, which is issued by the North British Rubber Company, of Castle Mills, Edinburgh. This little book, which is got up in a convenient form for the waist-coat pocket, gives an excellent map of the British Isles, showing where Clincher tyres may be obtained, and also a list of the addresses of their agents. A very useful route guide to some of the principal places in the kingdom is also included, as well as a complete list of the motor car identification marks arranged alphabetically. Readers of the AUTOMOTOR JOURNAL can obtain a copy of this useful little cloth-bound pocket book by applying direct to the North British Rubber Company, who are willing to supply it to any motorist, whether a user of Clincher tyres or not.

THE 70-h.p. Mercedes, 1905, model car, which attracted so much attention during the Paris Salon, can now be seen in London at the show rooms of Cannstatt Mercedes, Limited, 132, Long Acre, W.C. This chassis is specially suitable for side entrance bodies, and in several particulars is of new construction.

THE show room and offices of United Motor Industries, Limited, are now installed in the new large premises, 45 and 46, Poland Street, W., where all communications for the London head office should now be addressed.

FROTTOLINE is the name of a preparation which, applied to the glass of motor goggles and front screens, prevents the objectionable steaming which is so liable to take place. We have tried a sample tube which has been sent to us, and find it an efficacious remedy so long as the glass is not handled with the fingers.

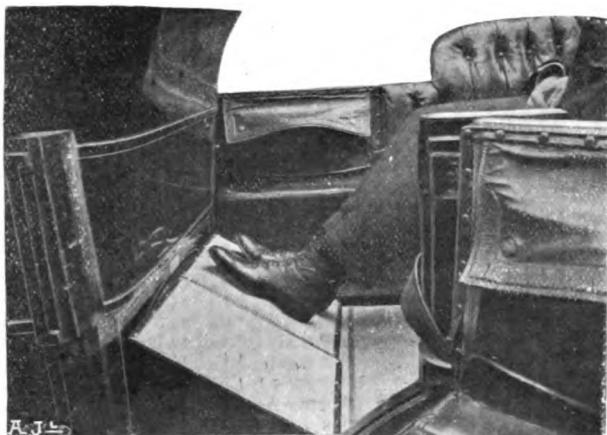
A NEW tyre is about to be placed on the market by the Swinehart-Clincher Rubber Company of America. We understand that the tyre will embody several new features, and has been specially designed to ensure a prolonged life and great resiliency. The Oldsmobile Company of America are, we are informed, fitting these tyres to many of their 1905 cars. For England, Messrs. Shippey Brothers have been appointed sole importing agents, and arrangements have been made with Messrs. Smith, Parfrey and Co., to build artillery wheels of any diameter and type of hub suitable for these tyres. Specimen wheels will be on view at the forthcoming Olympia Exhibition.

WE learn from Messrs. S. F. Edge, Limited, that owing to the great increase in the Napier business they find it impossible to conduct the whole of the Gladiator business, and from now the only Gladiator cars that will be sold from 14, New Burlington Street, are those up to 14-h.p. The other models will be handled by the Gladiator Company, 8 and 9, Long Acre, W.

OF the numerous testimonials received by the Collier Tyre Company from users of this successful tyre, many are valuable on account of the data they contain regarding the life and cost of upkeep, and of such a nature is the following letter from Mr. E. J. Burt, a copy of which we have received from the company:—

"I have now had your tyres running for fifteen months, and with the exception of the one unfortunate tyre I am very pleased with the way they have worn—especially as you know I am one of the hardest users of a motor car. The car has run about 15,000 miles with these tyres, two of which are still quite good. The cost of running works out at approximately $\frac{1}{4}$ d. per tyre per mile, which I do not think anyone could complain about. I have had no punctures, and therefore no worry.

"The fact that these tyres are your large size (36 ins. by $4\frac{1}{2}$ ins. by $5\frac{1}{2}$ ins.), for a heavy 20-h.p. car is, I think, a strong proof of the quality of the material your tyres are made of."



THE NAPIER COMBINED TOOL BOX AND FOOT-REST.—General view of the boxes when closed to form sloping foot-rests.

INDEX

A Novel Motor Tool Box.—Even on the best of motor cars the roominess is not generally so considerable as to allow of its being wasted; when, therefore, Messrs. S. F. Edge, Limited, decided that it would be conducive to increased comfort if a sloping foot-rest were fitted in the tonneau, they also considered that the space thus formed would be a very suitable receptacle for tools. The result is very clearly shown in the accompanying illustrations, in which Fig. 1 shows the sloping foot

rest, which forms the lid of the tool-box, in place in the car—an important addition to comfort, inasmuch as it materially assists the passenger to retain his seat when going over a rough road; Fig. 2 shows one half of the foot-rest raised up to expose one of the tool-boxes beneath; while Fig. 3 shows one of the tool-boxes removed from the car.

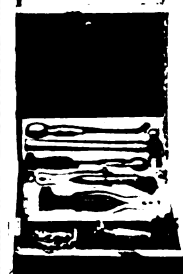
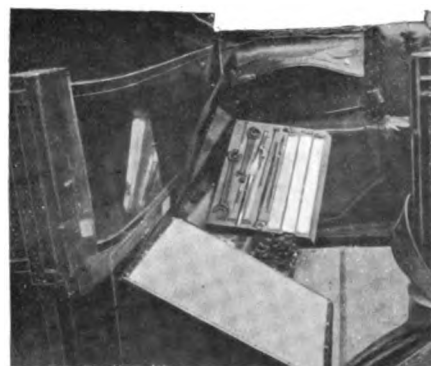
Two English ladies, Mrs. Lea and her daughter, Miss Hilda Lea, together with their maid and their chauffeur, named Jules Mironneau, starting on the 12th inst., are reported to have crossed the Alps by a route which must almost excite the envy of Captain Deasy. At any rate at one point they stuck so fast in the snow that they had to be dug out by fourteen peasants. As this was at the top of a pass they got down the other side all right, though not without encountering various serious dangers. The intrepid ladies traversed the road from Nice to Montreux, *via* the Haut Alpes, by way of Digne.

For a long time past there has been a good deal of smuggling by motor car abroad, and now the authorities of Paris are becoming victimised. They are dangerous people to play with, however, as any attempts to smuggle goods on which octroi is payable, by motor car into Paris, involve the confiscation of the offending car and its dedication to the benefit of the Administration. This penalty was recently enforced against a couple of automobile smugglers who were surreptitiously endeavouring to convey a supply of olive oil duty free into the French capital.

British Exports and Imports of Motor Cars, &c., for 1904.

Imports.

1904.	No. of Cars and Value.	Parts Value.	No. of Motor Cycles and Value.	Parts Value.
	£	£	£	£
January ..	335	102,866	51	1,528
February ...	538	185,499	87	2,971
March ...	492	169,166	178	5,774
April ...	559	170,757	141	4,498
May ...	530	224,129	121	3,961
June ...	581	248,579	122	3,240
July ...	633	251,472	70	2,226
August ...	594	243,729	69	2,240
September ...	386	169,472	8	536
October ...	282	117,296	34	1,027
November ...	237	99,518	94	2,772
December ...	211	97,888	4	79
TOTAL ..	5,378	2,080,371	979	30,855



THE NAPIER COMBINED TOOL BOX AND FOOT-REST.—View of one of the tool boxes open in the car, and also a view of one of the tool boxes removed from the car.

Exports, British and Irish make.

1904.	No. of Cars and Value.	Parts Value.	No. of Motor Cycles and Value.	Parts Value.
	£	£	£	£
January ..	55	25,168	78	3,000
February ...	65	23,913	73	3,147
March ...	55	24,064	49	1,787
April ...	42	15,119	65	2,249
May ...	30	10,954	56	2,146
June ...	27	7,485	66	2,931
July ...	48	16,812	43	1,859
August ...	53	15,760	58	2,594
September ...	71	25,246	64	2,608
October ...	67	15,806	72	3,052
November ...	96	30,161	73	3,288
December ...	94	31,220	74	2,456
TOTAL ...	703	241,708	771	31,117

Foreign and Colonial Re-exportation.

Parts Value.	No. of Cars and Value.	Parts Value.	No. of Cycles and Value.	Parts Value.		
£		£		£		
619	35	9,223	1,011	7	249	226
234	43	18,854	1,186	11	320	45
516	43	19,756	3,230	3	98	78
668	37	13,859	4,057	17	549	208
423	21	10,062	2,001	5	218	100
506	31	16,354	2,062	5	150	30
713	30	11,986	1,729	8	346	46
325	39	20,878	3,513	2	50	142
404	31	11,221	3,048	19	433	—
578	35	13,604	1,898	4	140	29
1,319	36	12,821	1,392	3	105	71
929	25	9,639	2,336	3	91	241
7,294	406	168,257	27,523	87	2,749	1,216

DOINGS OF PUBLIC COMPANIES.

Car and General Insurance Corporation, Limited.—The report of the directors for the year ended November 30th, 1901, states that the company commenced business on December 1st, 1903. Of the shares, 50,500 have been duly applied for and allotted, the directors meantime having decided to limit the issue to this number. The results of the first year's operations are: A gross premium income of £30,445, and, after deducting reinsurance premiums, a net premium income of £26,828; the appointment of 1,443 representatives of the corporation throughout the United Kingdom; and the opening and equipping of branch offices in Birmingham, Cardiff, Dublin, Edinburgh, Glasgow, Leeds, Liverpool, Manchester, Newcastle, and Southampton. The claims paid amount to £4,225. Including a liberal estimate for those notified but not settled on November 30th, 1904, the claims paid and outstanding approximate a total of £6,970. In addition, one-third of the net premium income, i.e., £8,942, has been set aside as a reserve against unexpired liabilities under policies granted prior to November 30th, 1904. The total expenses, including commissions, amount to £13,806. The greater part of this sum has been incurred in establishing an extensive branch and agency organisation, the benefits from which can only fully accrue during the next two or three years. The directors have, therefore, charged against the year's revenue two-thirds of this sum, i.e., £9,204, the balance to be charged against the next three years' income in equal proportions. The net result of the year's working is a balance of £1,875, against which the directors propose to charge the whole of the promotion expenses, amounting to £1,751, and to carry forward a balance of £123.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

Anglo-French Automobile Syndicate (Limited).—Capital, £1,000 in £1 shares.

Hall's Transmission Gear Syndicate (Limited).—Capital, £50,000 in £1 shares. Object, to adopt an agreement with W. Hall and others, to manufacture transmission gears of all kinds, &c.

Irish Motor Car Company (Limited), (registered in Ireland), Golden Lane, Dublin.—Capital, £1,000 in £1 shares.

London Motor Omnibus Company (Limited), 794, Salisbury House, E.C.—Capital, £103,000 in 100,000 ordinary shares of £1 each and 60,000 deferred shares of 1s. each. Directors, Sir Henry Seton-Karr, C.M.G.; E. H. Bayley, Clarence Freeland, Thomas Otley.

Mutual Garage and Motor Association (Limited).—Capital, £10,000 in £1 shares (7,500 preference). Object, to adopt an agreement with F. Bryson and C. L. Baker, and to carry on the business of vendors and factors of motors, motor cars, yachts, &c.

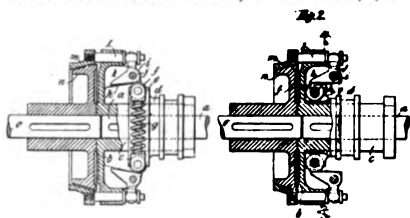
Stradling and Plenty (Limited), 79, Northbrook Street, Newbury, Berks.—Capital, £9,000 in £1 shares. Objects, to acquire the business of cycle manufacturers and agents, &c., carried on by J. Stradling at 79, Northbrook Street, Newbury, and the business of motor engineers, agents, garage proprietors, &c., carried on by J. Stradling and E. P. Plenty at the same address as Stradling and Plenty. J. Stradling and E. P. Plenty are governing directors.

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, 232, Strand, W.C.

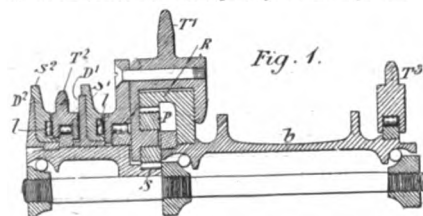
The first date given is the date of application; the second, at the end, the date of the advertisement of the complete specification.

856. 13th Jan., 1904. Impts. in Variable Gear for Cycles and Motor Vehicles. H. L. Callendar, 2, Chester Place, Regent's Park, London, N.W. This invention relates to the application of a slipping or free-pawl-clutch with a variable speed-gear for cycles and motor vehicles, and as the slipping engages by friction, shock is avoided. There are four figures. Fig. 1 is a half section, showing the application of the invention to a motor cycle change-speed-gear. Fig. 2 is a diagram of the pawl-clutch. R, is an internal-toothed-ring fixed to the hub δ . T², T³, are free-wheel sprocket-wheels driven by chains from the pedal axis. P, are planet pinions, rotating on studs on a ring fixed to the sprocket-wheel, T¹, driven by the engine. S, is the sun-pinion. S¹, S², are two slip-ring-clutches on a sleeve fixed to the sun-pinion, S. The slip-ring-clutches, S¹, S², can each be held and prevented from turning by a catch. When released and allowed to turn, the rollers, r, are acted upon by inclines such as are used in a free-wheel, and are so caused to thrust them against friction discs, D¹, D², fixed to the sun S. Slipping S¹ locks the sun-pinion to the planets. T¹, being driven by the engine a high gear is obtained by holding T², and consequently the sun-pinion

out of gear. Fig. 2 is a similar section showing the clutch in gear. Keyed on the shaft, a, is a drum, δ , with an extended boss, c, upon which is a sleeve, d, free to slide thereon. The sleeve, d, has brackets, e, to carry the rollers, f, which are pressed upward by the springs, g, to engage with the underside, h, of the elbow or bell crank levers, i. The levers, i, turn



on the fulcrum pins, j, fitted in the lugs, k, formed with the drum, δ . When the sleeve, d, is moved from the position shown in Fig. 1, to that shown in Fig. 2, the rollers, f, cause the levers, i, to turn on their pivots, j, and by means of the rods, l, in the drum δ , bring the outer cone, m, into frictional contact with the inner cone, n, keyed on the shaft, o. The point of this construction is that while the rollers, f, and the levers, i, effect a powerful frictional grip between the two cones, it is by the intermediary of the springs g. When the clutch is released, and the sleeve, d, and the rollers, f, have been returned to the position shown in Fig. 1, the pressure of the springs coming on the other side of the fulcrum, j, would tend to release the clutch, but this is not mentioned in the specification.—Dec. 30th, 1904.



stationary. The middle gear is obtained by slipping S¹, and driving T¹, by the pedals, and a low gear by holding S², slipping S¹, and driving partly through T² and T³. A free engine is obtained by holding both S¹ and S². In Fig. 2, the pawl, U (one only is shown), fit in circular recesses in the sprocket-wheel, V, and are free to turn on the studs, W. The pawls are depressed into the dotted position shown, by light springs to engage with the ratchet and operate the clutch. To release the clutch, a ring, X, which fits in a groove in the sprocket, V, is moved a short distance by means of a catch. The catch consists of a projecting pin, Z, on the ring, X, acted on by a rod, Y. The drawings show a somewhat similar construction as applied to a motor vehicle gear, but without the internal gear-wheel, planet pinions, and sprocket-wheels, the inclined plane-clutches being applied to external gear-wheels and pinions on parallel shafts.—Dec. 30th, 1904.

2675. 3rd Feb., 1904. Impts. in Driving Mechanism. L. Tolch, The Boat Yard, Fulham, London, S.W. The object of this invention is an improved construction of friction clutch. There are three figures. Fig. 1 is a section showing the clutch

Patent Specifications Published.

Applied for in 1903.

Published December 29th, 1904.

26,886. A. G. IONIDES. Transmission mechanism.
26,908. A. HUNNABLE. Chains.
27,522. R. TREKOW. Electric igniting devices.
27,739. F. H. SMITH. Governors.

Published January 5th, 1905.

21,974. B. HAGEN. Variable speed-gear.
25,706. W. CUNNINGHAM. Liquid fuel burner.
27,320. H. S. EYRE. Anti side-slip device.
27,433. W. C. H. SCOTT. Harvester attachment.
27,513. H. N. BICKERTON. Governors.
28,058. T. G. STEVENS. Bearing springs.
28,451. R. P. FUGE. Motor cycle supports.
28,577. J. H. CHAMBERS. Change-speed-gear.

Published January 12th, 1905.

28,097. E. B. LUDLOW. Road motor vehicles.
28,180. W. H. THOMPSON. Speed-gear.
28,233. E. GREGG AND T. H. HIRST. Tyres.

Applied for in 1904.

Published January 5th, 1905.

1,815. R. LAURENCE. Motor car designs to facilitate disposal of spare tyres and accessories.
2,793. HUMBER, LTD., AND H. E. EARL. Transmission mechanism.
3,111. A. G. MELHUISH. Internal combustion engines.
3,163. LORD AND COLLINGBOURNE. Road wheels.
3,251. — CONSTANT. Carburetors.
3,571. W. MAYBACH. Internal combustion engine.
3,670. — TOLLEMACHE. Means for inflating tyres.
4,095. H. RIGBY. Cooling of cylinders and exhaust valves.
5,832. W. J. LLOYD AND W. PRIEST. Variable speed-gear.
7,516. L. FRIEDMANN. Steam generators.
22,001. C. LEMALE. Internal combustion turbo-motors.
22,368. M. P. RYDER. Electric ignition.
23,509. G. F. GROTZ. Water-cooling apparatus.
24,394. D. COUVERCHEL. Electric circuits for lamps.
24,572. DE DION AND BOUTON. Electric igniters.
24,695. W. F. VON SCHOLLEY. Motor cycles.
24,772. W. BRUHN. Distance indicator.
24,802. A. MANS. Suspension springs.

Published January 12th, 1905.

1,092. R. C. N. PALAIRET and others. Turbine motors.
1,419. G. PRIVETT. Clutch mechanism.
1,979. F. R. SIMMS. Frames or chassis.
2,630. D. D. MACPHERSON. Brakes.
2,731. C. C. BRAMWELL. Frames.
2,913. SIR J. I. THORNYCROFT. Carburetting apparatus.
3,094. — CRISPIN. Motor-driven bicycles.
3,224. — DENNIS. Motor road vehicles.
3,452. — CONSTANT. Carburetors.
3,572. W. MAYBACH. Cooling device.
3,573. W. MAYBACH. Cooling device.
4,956. W. MAYBACH. Compound internal combustion engines.
7,666. L. RENAULT. Cooling arrangements.
9,107. E. CROMPTON. Steam generators.
11,990. C. WEIDMANN. Combustion engines.
12,484. A. FRY. Combination tool.
16,517. W. FLETCHER. Automobiles.
19,578. A. F. MADDEN. Motor vehicles.
19,984. L. KOENNECKE. Vaporisers.
21,312. G. C. BROWN. Airships.
22,100. J. C. MERRYWEATHER. Automobile fire brigade vehicles.
23,022. P. C. HEWITT. Carburetors.
23,184. W. H. AND G. E. RUSSELL. Means for producing inflammable gas, and utilising the same in internal combustion engines.
25,513. MARQUIS DE DION AND G. BOUTON. Carburetors.
24,642. J. L. BOBERT. Internal combustion heat engine.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

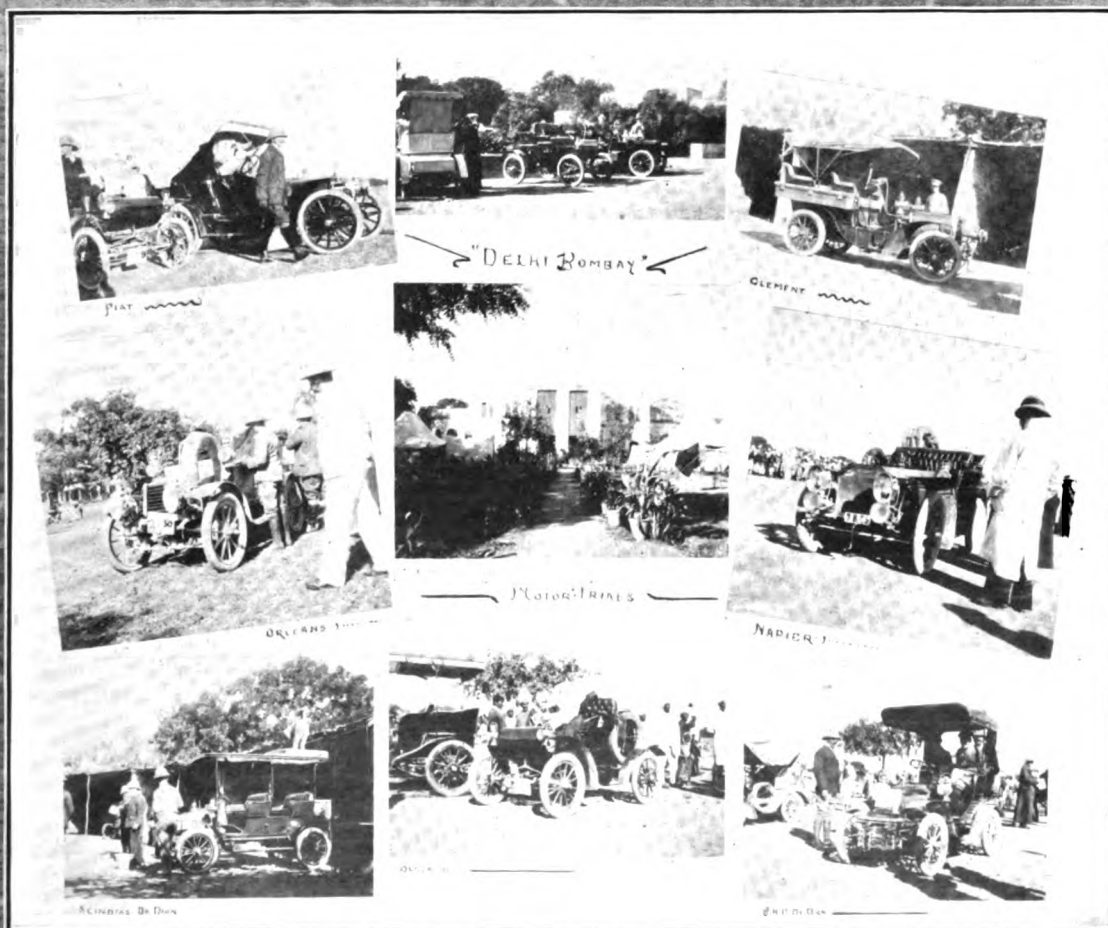
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JANUARY 28TH, 1905.

[Registered at the G.P.O.
as a Newspaper.]

[Weekly, Price 8d.
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DELHI-BOMBAY RELIABILITY TRIAL.—A group of interesting photographs in connection with these trials, showing some of the leading cars that took part in the competition, including a Fiat, a Clement, an Orleans, a Napier, the Maharajah Scindia's De Dion, an Oldsmobile, and one of the other winning De Dion cars.

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NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C., by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
Jan. 21-28 ...	Birmingham Motor Car Show (Bingley Hall).
Jan. 24 ...	Lesson VI.—On the Internal Combustion Engine (Ladies' A.C.).
Jan. 26 ...	*Problems of Traffic, by Mr. J. Swinburne.
Jan. 27-Feb. 4	Crystal Palace Automobile Show.
Jan. 30 ...	Motor Fuels, by Dr. Ormondy (Scottish A.C.).
Feb. 7 ...	Motor Mountaineering in the Alps. Illustrated lecture by Capt. Deasy (Ladies' A.C.).
Feb. 10-18 ...	Society of Motor Manufacturers' and Traders' Exhibition at Olympia.
Feb. 10 or 17	*Quarterly 100 Miles Trials.
Feb. 13 ...	Motor Volunteer Corps Dinner (Trocadero).
Feb. 15 ...	A.C.G.B.I. Annual Dinner (Hotel Cecil).
Feb. 24-Mar. 4	Edinburgh Motor and Cycle Show.
Feb. 24 ...	Manchester Motor Show.
Mar. 3-11 ...	Liverpool Motor Cycle Show.
Mar. 8 ...	*A.C.G.B.I. General Meeting.
Mar. 18-25 ...	Cordingley and Co.'s Exhibition (Agricultural Hall).
Apl. 3-8 ...	Auto Cycle Club Light-weight Motor Bicycles Trial (1,000 Miles).
Apl. 26-May 31	*Van Trials, Light and Heavy Vehicles.
Apl. 29 or May 1	May Day Parade
May 6 ...	Auto Cycle Club Hill Climb.
May 11-13 ...	Scottish A.C. Reliability Trials.
May 12 or 19 ...	*Quarterly 100 Miles Trials.
May 30 ...	*Gordon-Bennett Cup, British Eliminating Trials.
May 31 ...	Auto Cycle Trials.
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.).
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 8 ...	Auto Cycle Club Consumption Trial.
July 13 ...	*Hill-Climb (Henry Edmunds Trophy).
July 19 ...	*Brighton Speed Races.
July 24-28 ...	*Motor Boat Trials (Southampton).
Aug. 11 or 18	*Quarterly 100 Miles Trials.
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.
Sept. 12 ...	Auto Cycle Club Race Meeting.
Sept. 14 ...	*Tourist Trophy (Isle of Man).
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).

* Automobile Club of Great Britain and Ireland Events and Papers.

Sept. 18-Oct. 3	*Reliability Trials.
Oct. 4 ...	*Speed Trials.
Nov. 10 or 17	*Quarterly 100 Miles Trials.

Foreign Events (Trials, Races, &c.).

1905.	
Jan. 21-Feb. 6	Turin Automobile Exhibition.
Jan. 23-28 ...	Ormond-Daytona Beach (Cal.) Meeting.
Feb. 4-11 ...	Chicago Exhibition.
Feb. 4-12 ...	Stockholm Meeting and Ice Racing.
Feb. 4-19 ...	Berlin Automobile Exhibition.
Feb. 11-25 ...	Cannes Automobile Fortnight.
Feb. 13-16 ...	Detroit Exhibition.
Feb. 15 ...	Turin Automobile Salon.
Feb. 18-25 ...	Versailles Reliability Trials (A.C. Seine et Oise).
Mar. 13-18 ...	Boston Exhibition.
Mar. 15-Apl. 9	Copenhagen Exhibition.
Mar. 16-29 ...	Vienna Exhibition.
Mar. 27-Apl. 5	Washington Exhibition.
Apl. 2-16 ...	Monaco Motor Boat Fortnight.
Apl. 14-23 ...	Nice Automobile Week.
Apl. 17 ...	Speed Mile and Kilometre (Nice).
Apl. 18 ...	Coupe de Caters (Nice).
Apl. 20 ...	Coupe Burton (Cannes).
Apl. 20-21 ...	Cannes Motor Boat Meeting.
Apl. 23 ...	Coupe Provinciale (Nice).
May ...	Paris Industrial Vehicles Trials (A.C. France).
May 4-12 ...	Auto Cycle Club de France Tour.
May 11-25 ...	Stockholm Automobile Exhibition.
June ...	International Motor Cycle Cup.
June 26 ...	Mont Cenis Hill Climb.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Calais-London (Motor Boats).
July 30 ...	Circuit des Ardennes.
Aug. 6-9 ...	Paris-Trouville (Motor Boats).
Aug. 10 ...	Gaston Menier Cup (Motor Boats).
Aug. 11 ...	Anthony Drexel Cup (Motor Boats).
Aug. 12 ...	International Cup for Motor Boats.
Aug. ...	Herkomer and Bleichroder Races.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Vincenzo-Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.
Sept. ...	Tourist Car Trial (A. C. de France).
Sept. 3-10 ...	Royan Meeting.
Sept. 3-10 ...	Spa Automobile Club.
Sept. 11 ...	British International Cup (Motor Boats Arcachon).

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PASSING EVENTS.

The Gordon-Bennett Race—The French Non-Possumus.

THE protest of the A.C.G.B.I. against holding the Grand Prix and the Gordon-Bennett Race at one and the same time and on one and the same course, the general demerits of which scheme we discussed in our number of January 7th, was last week forwarded to the Automobile Club de France, and that Club has, with a degree of autocracy, more suggestive of the Neva than the Seine, refused to entertain it in any shape or form. The French club are evidently determined to carry out their proposal whether the other participating clubs like it or not, and without being extravagantly courteous to the other clubs either. At any rate, the German Club was for a considerable time left without any official intimation of the proposed arrangement, and the only official intimation that has apparently been vouchsafed to the English Club is that which is included in the letter of refusal to entertain their objection. It is possible that the French Club is as omnipotent as the attitude it has assumed would lead the general public to suppose. It is, at any rate, a powerful body, and it would seem that there is nothing in the Gordon-Bennett Rules to prevent what we cannot help continuing to regard as the high-handed action that they propose to adopt. They may have the Government of the Republic in the hollow of their hand, but again it is just possible that they have not. The authorities were badly scared by the Paris-Madrid fiasco. The combination of the Gordon-Bennett and the Grand Prix in the Auvergne Circuit will probably mean a very large number of cars starting, and considering that the course is a circuit, they will probably have to start with almost as short intervals between them as in Paris-Madrid. This certainly looks like courting disaster. One of the principal occupations of the automobile industry, since that unfortunate event, has consisted in living down the prejudice which it created. It is possible that, bearing this in mind, the Government of the Republic may refuse to grant permission for holding the two events at one and the same time. Should the Government come to this conclusion we feel convinced that they will be acting in the true interests of the automobile movement, even if in doing so they run counter to the somewhat dictatorial attitude of the body which is its official representative in France. Quite apart from the sporting aspects of the question, the determination of the French club seems to us mistaken from the point of view of common prudence and ordinary foresight. In the interests of the movement in all countries it is to be hoped the French Government will take a different view from that of the French Club. It will not benefit the industry at all if, as the result of running the two races together, accidents occur which will give an opportunity to the opponents of automobilism in all countries to pour forth the sort of diatribes with which we were favoured in 1903. The Juggernaut is not dead. He is only sleeping, and there are plenty of willing journalists, horse owners and old fogies, only too anxious for the slightest pretext or excuse to drag him forth again, and deck him out with even greater terrors than those with which he was embellished before.

Retaliation versus Protest.

It is always difficult to foresee what event will ultimately become the most important in the racing

world. It is quite possible that the Tourist Trophy Race, which the Automobile Club of Great Britain has undertaken to organise, will ultimately become a highly important international competition. At any rate, it will provide the buying public, to a much greater extent, with the kind of information they want to obtain than any competition of cars built wholly and solely for racing purposes can ever do. To win this event may ultimately, therefore, become quite as important for foreign, and particularly French manufacturers, as the Gordon-Bennett or their own Grand Prix. The question, therefore, is one of considerable interest as to whether British manufacturers and drivers, as represented by the Automobile Club of this country, should attempt to retaliate against the tactics adopted by the French Club, and introduce regulations which will have the practical effect of a handicap in favour of British competitors. Mr. Claude Johnson is at any rate of the opinion that this is a wise thing to do, and he has given general notice in the Press (in the form which we reproduce elsewhere) that at the next meeting of the committee of the Automobile Club (of which he is a member), he will move a resolution that "in all races and competitions held under the rules of the club in future, including the race for the Tourist Trophy, the number of entries of cars made in a foreign country should be limited to two cars for every five British cars entered." The proposal has much to be said for it. In the first place it is a thoroughly deserved *tu quoque*, and it will certainly operate to the advantage of English competitors. But—we are not sure that we altogether like it. We venture to think there are British competitors who would far prefer to win in an open and absolutely unrestricted competition. As things are at present, if the French win the Grand Prix or the Gordon-Bennett Race, everybody will feel that the result might have been different but for the rules they made themselves, and there will certainly be a tendency for the public to think that if the Tourist Trophy is won by an English car it will not prove that the English car is better than the French car, if the same number of French or other foreign cars are not allowed to enter. There is a proverb too, which originated, we believe, in France, though the behaviour of Frenchmen at the present day in sporting matters is sometimes calculated to make us forget it—*noblesse oblige*. After contending that the French proposals are unsportsmanlike, there seem to be strong objections against adopting very similar regulations ourselves.

Delhi to Bombay Automobile Trials.

As details both of the behaviour of the cars that took part in this trial—in many respects one of the most important events of an important motoring year—and particulars of the impression which it has produced throughout the length and breadth of India come to hand, we are enabled to gauge the enormous importance which the Trial unquestionably will have in the development of automobilism generally, and ultimately no doubt in the social and commercial advancement of India and the East. The Trial has been successful probably beyond the most sanguine expectations, either of its organisers or of the enterprising competitors who sent out cars from this country to show the Indian public to what a pitch of perfection the development of the automobile has now attained. The conditions were to a large extent unknown. The plucky competitors were

adventuring themselves into what was largely a *terra incognita*, but their adventurousness was well rewarded.

The large number of cars which successfully traversed the distance of nearly 900 miles from Delhi to Bombay is a testimonial to the reliability of the modern car, which to judge from the enthusiastic encomiums of the Indian press, was a revelation to the Anglo-Indian public.

The trial has brought another revelation, both to a large number of Anglo-Indians who took part in it, and to the competitors. It has been shown that India promises to be in all probability the "earthly paradise" of motorists. Not only are the roads in general splendid, but they have remained splendid since they were engineered in the days of the energetic old East India Company, and this in spite of the fact that they have now become almost unknown to many of the inhabitants. India is not by any means plentifully provided with railways, but there are enough railways to draw the greater portion of the travelling population off the roads, and still the roads remain good. Of the whole distance from Delhi to Bombay, only about 45 miles can, it appears, really be called bad. There is one other short section that is indifferent, but not so indifferent as to seriously incommode good cars, and the rest is apparently almost ideal. The climate, at any rate in the cold weather, is certainly so. In the early morning and late at night, at this time of year, it is occasionally chilly, but even then practically never requires the assumption of the kind of clothing that motoring necessitates at home, while the sun can always be relied upon to come up towards middle day and dispel any chills which the morning may have left behind it. The air the competitors describe as like champagne, and the scenery beautiful in the extreme. It must be remembered, too, that the Great North Road, on which the competition took place, is only one of the great roads of India. Even better is said to be the Grand Trunk Road, and there are a large number of excellently engineered roads with good surface, though little used, connecting the principal centres. An encouraging feature seems to have been the common sense behaviour of the population, amongst whom, though they were encountering a number of motors for the first time in their lives, not a single accident appears to have taken place. Probably, from a touring point of view, motoring in the near future in India, at any rate, will be mainly confined to the cool weather, but no doubt cars will be adapted to render travelling even in the summer, with the rush of air which the rapid movement causes, at least bearable. In demonstrating on so grand a scale, both the suitability of the Indian roads for automobilism and the reliability of the modern automobile under the climatic conditions there prevailing, the organisers of the competition, the Motor Union of Western India, have done excellent service, both for the automobile industry and to the development of India, while, in addition, it may be said that the English manufacturer has obtained a hold on the Indian market. He will probably find the Indian market become a valuable one. The ultimate effect in benefiting the population cannot fail to be immense. Great as is the actual length of the Indian railways, they are a mere nothing compared with the enormous extent of the country, and India is therefore a field in which the benefits of improved communication will be both more appreciated and more needed than in most other countries. Once the movement is thoroughly initiated in the country, progress is

likely to be rapid. Of course, at present, there are difficulties. There are the difficulties of the supply and the storage of petrol, but this, as the *Times of India* points out, is largely a matter of demand. Given the demand, the trials have shown that it can be supplied. There are also many districts in which bridges will be needed when traffic increases, but the Government of India, which is more paternal than that at home, may be trusted to look after this side of the question. The greatest difficulty of all—doubt as to the real reliability of the automobile—the Delhi to Bombay Trial has permanently removed.

◆ ◆ ◆ The Usual "Amari Aliquid."

As the event has been so generally successful, and above all has produced so important and useful an effect on Indian public opinion, it is all the greater pity that the "something bitter" which, according to the Latin proverb, usually crops up to mar the pleasantest celebrations, has put in its ill-omened appearance in the present case. We, of course, refer to the discontent which the judges' bestowal of the Cup presented by the Gaekwar of Baroda seems to have evoked among the other competitors. The feelings of the dissatisfied parties have been summed up and somewhat forcibly expressed in the protest which we reproduce on another page. Probably there are reasons which have induced the judges to take the action they have done with which the general public and the competitors are not acquainted. In this case, they will no doubt welcome the opportunity afforded them by the protest to publish, as the protest invites them to do, their reasons for making the award. Till they have had time to do this, it is only fair that the question should be regarded as in the fullest sense of the word *sub judice*.

◆ ◆ ◆
The Protection of the British Motor Industry.—Mr. Claude Johnson has sent us the following communication, to which we refer elsewhere, in regard to the action of the A.C. de France in claiming that France is entitled to a larger representation in automobile sporting events than other countries:—

"On Thursday last, Mr. Claude Johnson handed in at the Automobile Club a written notice that at the next meeting of the Committee of the Club (4th February) he will move a resolution that all races and competitions held under the rules of the club in future, including the race for the Tourist Trophy, the number of entries of cars made in a foreign country should be limited to two cars for every five British cars entered.

"Mr. Johnson points out that the Automobile Club of France, in spite of the predominance which France has in the motor industry, has decided that in the great competition of the year the number of alien cars, as compared with the number of French cars, should be in the above proportion. If this has been found necessary in France, he argues that it is far more necessary in England, where, owing to legal restrictions, the motor industry was hampered, with the consequence that the United Kingdom fell behind in the race for the supremacy in the motor industry.

"If the proposal were adopted, in all future competitions held in this country the number of entries would be limited, England having five cars against two cars of any other country, and the Automobile Club of a country would decide, and notify the British Club, what cars were selected to represent their country in the competition."

May Day Parade.—The continuation of this procession of heavy motor vehicles will, it is thought by the Motor Van and Wagon Users' Association, be inconvenient both to the users and the general public, and they therefore suggest to the Automobile Club that it is not desirable to repeat the parade this year, last year's march past having fulfilled its purpose.

INDEX DELHI-BOMBAY TRIALS.



DELHI-BOMBAY RELIABILITY TRIAL.—The Control outside Bombay, where the cars congregated and started in procession through the streets of that city. The cars, reading from left to right, are De Dion, Lanchester, Fiat, De Dietrich, and Napier; No. 27, immediately behind the Napier, also being another De Dion car.

Now that this historic trial is over, its particularly successful nature can be appreciated to the full. Whilst it was taking place, everyone agreed, as each day passed, that the organisation was excellent, and the cars shaped well to their Indian work. Considering, too, that among the thirty-eight competitors there was a car of

30-h.p. and a car of $3\frac{1}{2}$ -h.p., while the 6-h.p., 10-h.p., and 20-h.p. vehicles—among which were steam cars and others using kerosene as fuel—were reasonably proportioned between these limits, it may at least be assumed that the trial was a fairly representative one. The general success of the vehicles, therefore, is all the



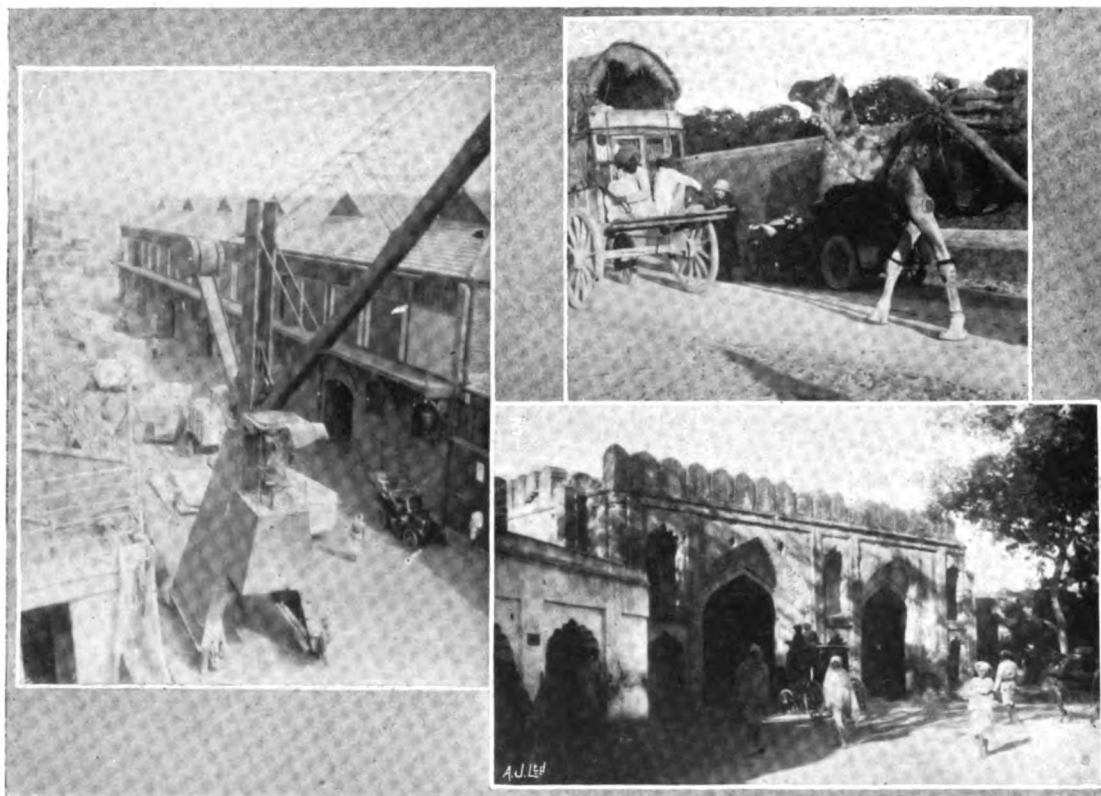
DELHI-BOMBAY RELIABILITY TRIAL.—In spite of the excellent roads of India the competitors in the Delhi-Bombay Reliability Trial, on at least one occasion, found themselves in a situation new to automobilism. They had, during the last stage, to cross a broad creek near the town of Kalyan by the old-fashioned ferry boat. The above illustration shows the car being ferried over by Indian natives who propel the ferry boat by paddles, whilst the second view, on page 99, shows the ferry boats, with the cars on board, close in shore.

more satisfactory since it can hardly be expected that the craze for motoring, once it seriously attacks India, will be productive of a demand for only one class of vehicle, any more than it has in this and other countries devoted to the sport. A representative variety, therefore, is distinctly what is wanted among the competitors of such a trial, and it was with this end in view that the Motor Union of Western India organised the great event as an effective means of bringing before the notice of the Indian public the principal cars which are at once the envy and the pride of the public in other countries.

To organise a cross-country run of some 900 miles is no light task, but by the indefatigable efforts of the Motor Union and especially those of their hon. secretary, Mr. Hoare, coupled with the gracious help of the local

Not the least of the difficulties in organising a tour through a district so sparsely populated *en route* as was this, refers to the provision of suitable accommodation at the various stopping places. By a happy inspiration, the very ingenious idea of chartering a special train to act as a moving hotel was hit upon, and proved an excellent scheme. Of course it was only practicable to put it into operation at certain places where the route and the railway were in proximity, but, even so, the accommodation and catering afforded by one of the best G.I.P. trains was a much appreciated boon.

Punctures were, as has been inferred already, the main cause of delay, and may, in the majority of cases, be attributed to the loss of marks indicated in the accompanying table. On the first day cars Nos. 7, 9,



1. Some of the Competing Cars being landed at Bombay, from the s.s. "Persia."
2. "Obstacles" by the way, outside Delhi. The camels attached to wagons were found to be very shy of the cars, and endeavoured to bolt upon the slightest provocation. The car in the background is the Napier driven by Mr. Basil Johnson.
3. The famous gateway through which the cars passed at the start from Delhi.

DELHI-BOMBAY RELIABILITY TRIAL.

residents, presiding Maharajahs, and others too numerous to mention, this has been successfully accomplished to the credit of all concerned. In England, we are too used to trials of the reliability class to evince very great interest in their details, and those in India were naturally similar in many respects, and only in tyre troubles were they worse. Such a phenomenal crop of punctures, mostly caused by the cast nails from bullock shoes, could hardly pass without remark, for scarcely a car got free, and it was reported that even a tyre protected with a redoubtable non-skid leather band was once pierced through. Apart from this, the roads were good, especially on the first four or five days; passing through the jungle, however, the track was anything but pleasant.

and 10 had ignition troubles, while Nos. 12 and 28 had trouble with their petrol tanks, and No. 37 had to draw up to attend to some trouble with the circulating water. No. 33, unfortunately, caught fire and retired, as did No. 36, owing to one of the solid tyres being cut through and rendered useless. The second day was somewhat less productive of casualties other than tyre troubles, while the same may be said of the third day, when No. 14 broke a crank-shaft, and retired. On this day also No. 2 retired owing to the driver having come as far as he originally intended. On the seventh day No. 17 had to retire through trouble with the feed-water, and on the last day No. 15 was also put out of the trial by breaking the steering gear.

The successful running of some of the English cars, notably the Wolseley, Napier, and Lancheester, gives great cause for congratulation. Of the two cars which alone were successful in coming through the trials without losing a single mark, one was a 6-h.p. Wolseley, a feat—reminiscent of the Small Car Trials—for which it was awarded the Consolation Prize! Indeed the awards—which stand as published by us on January 7th last—have been the cause of no little discussion among those interested, and a formal protest, reproduced below, has been addressed to the judges, Colonel Grantham, Major Murray, Capt. Dickson, Mr. Morton Bell, and Mr. J. Hall, asking that information may be given concerning the grounds on which they were based.

No.	Car and Entrant and points deducted daily.	Total.
1.	3½-h.p. Lenoir (J. W. Hall), 1st, 40; 2nd, 94; 3rd, 147; 4th, 92; 5th, 199; 6th, 10; 7th, 182; 8th +	764
2.	5-h.p. Humberette (C. A. Cooke), 1st, 14; 3rd * ...	—
3.	6-h.p. Speedwell (G. V. Scovell), 1st, 64; 2nd, 1; 3rd, 63; 4th, 11; 5th, 13½; 6th, 15; 7th, 2; 8th, 2 ...	171½ (S)
4.	6-h.p. Wolseley (Lieut. Skelton), 2nd, 48; 5th, 40; 8th, 138 ...	226
5.	6-h.p. Wolseley (Capt. Muter), 1st, 23; 4th, 15; 5th, 59; 6th, 2; 7th, 19; 8th, 7 ...	125
6.	6-h.p. Wolseley (R. J. Vakil) ...	0 (C)
7.	6-h.p. De Dion (B. H. Hewett), 1st, 3; 5th, 2; 6th, 1; 8th, 1 ...	7 (M)
9.	7-h.p. Oldsmobile (K. A. Wadia), 1st, 39; 2nd, 3; 3rd, 7½; 5th, 1; 6th, 5; 8th, 1 ...	56½
10.	7-h.p. Allday (A. Levetus), 1st, 3; 4th, 2; 5th, 5; 6th, 15; 7th, 32 ...	57
12.	8-h.p. De Dion (R. A. Lamb), 1st, 9; 4th * ...	—
14.	8-h.p. Panhard (H. Sorabji), 3rd * ...	—
15.	9-h.p. Beaufort (H. A. H. Payne), 4th, 1; 8th + ...	—
16.	10-h.p. Argyll (R. Grant), 1st, 3; 4th, 6; 5th, 4; 6th, 1; 7th, 8 ...	22
17.	10-h.p. Serpollet (M. C. Petit), 3rd, 13; 5th, 8; 6th, 6; 7th * ...	—
18.	10-h.p. Renault (Lieut. Rose), 1st, 4; 2nd, 55½; 3rd, 12; 4th, 10; 5th, 19½; 6th * ...	—
19.	10-h.p. Rational (L. Gresham), 2nd, 11; 4th * ...	—
20.	10-h.p. Humber (Major Warren), 1st, 6; 4th, 19; 5th, 53; 6th, 30; 7th, 1; 8th, 82 ...	191
21.	8-h.p. De Dion, 1st, 6; 2nd, 10; 3rd, 55; 4th, 57½; 5th * ...	—

23.	10-h.p. Serpollet (J. H. Abbott), 1st, + 3rd * ...	—
25.	12-h.p. Lancheester (K. S. Ranjitsinhji), 1st, 1½ ...	1½
26.	12-h.p. De Dion (S. Inglis), 5th, 1 ...	1 (K)
27.	12-h.p. De Dion (H. H. Maharajah Scindia), 4th, 7; 5th, 115; 6th, ½; 7th, 2; 8th, 1 ...	125½
28.	12-h.p. De Dion (Dr. A. H. Deane), 1st, 5; 2nd, 165; 3rd, 2; 6th, 3; 7th, 30 ...	205
29.	12-h.p. Darracq (P. C. Sawyer) ...	0 (L)
30.	12-h.p. Orleans (F. A. Rodevald), 3rd, 2; 4th, 18 ...	20
31.	15-h.p. Darracq (Huntley Walker), 1st, +; 2nd * ...	—
32.	12-h.p. Clement (Arthur Hoare), 4th, 10; 5th, 17½; 6th, 16½; 7th, 21½; 8th * ...	—
33.	16-h.p. Fiat (Count di Gropello), 1st, 21; 3rd, 48½ ...	69½ (R)
34.	20-h.p. Thornycroft (J. A. Dent), 2nd, 10; 4th, 6; 6th, 2; 7th, 3½ ...	21½
35.	20-h.p. Napier (S. F. Edge), 3rd, 2 ...	2
36.	Serpollet (H. H. Maharajah of Pudukottah), 1st +; 3rd * ...	—
37.	24-h.p. De Dietrich (W. L. Sorel), 1st, 28; 6th, 30 ...	58 (G)
38.	30-h.p. Darracq (Huntley Walker), 1st, 5; 3rd, 2; 4th, 8; 5th, 8½; 6th, * ...	—

* Retired. + No return.

(G) Gaekwar's Cup for reliability. (S) Scindia's Cup for economy. (M) Mysore Trophy for condition. (K) Kapurthala's Cup for suitability. (R) Rampur Trophy for silence, smooth running and easy manipulation. (L) Lyon Cup for reliability (limit price, £500 in India). (C) Consolation prize given by the *Times of India*.

COPY OF THE PROTEST.

Bombay, 2nd January, 1905.

To the Judges, Delhi-Bombay Reliability Trials.

SIRS,—Having been informed that the first prize—the Gaekwar's Cup—is to be given to the De Dietrich Car, we should be obliged if you would state your reasons for awarding this, as we protest that the Judges have insufficient knowledge of motor cars so entirely to disregard the performances of the respective cars which have done infinitely better throughout the whole trials than the De Dietrich, which according to the rules of the competition and the reports of the observers has lost 58 marks on account of a most serious defect to the engine, viz., a defect which caused it to stop 28 minutes on the road and lose all its cooling water—one of the most serious mechanical troubles that a car for use in India could have had—and many marks were lost for tyre troubles, as laid down in the rules of the competition, which rules the Judges have not the power entirely to disregard.

There are a very large number of cars which have lost far fewer marks in the competition than the De Dietrich, several of which have lost no marks at all for mechanical defects, and there are two cars which have lost "no marks at all" for either mechanical defects or tyre troubles!



DELHI-BOMBAY RELIABILITY TRIAL.—Two of the competing cars, and their "retinue," on the Kalyan Ferry.

Yet in the face of these figures and facts, about the reliability of which there is no doubt whatever, as they are deducted in exact accordance with the rules by the official observers appointed by the Union, you, as Judges, who disclaim having anything but a smattering of practical or scientific knowledge of motor cars, have taken on yourselves entirely to reverse the results of the severe trials the cars have had during the last eight days and have awarded the trophy to a car because you consider it the best, and not because the rules and marks show it to be the best.

As representing the interest of owners who have spent amounts totalling some thousands of pounds in order to take part in these trials, we ask for a full report from the Judges, and your reasons for taking so much on your hands, and in so entirely reversing the proof

of the convincing figures which you had before you, knowing yourselves to be so ignorant and devoid of either practical or technical knowledge of the subject.

We cannot believe that it was the Gaekwar's intention that so important a matter as the actual results were to be entirely reversed by the Judges, especially as the reputations of several of the largest European manufacturers are implicated.

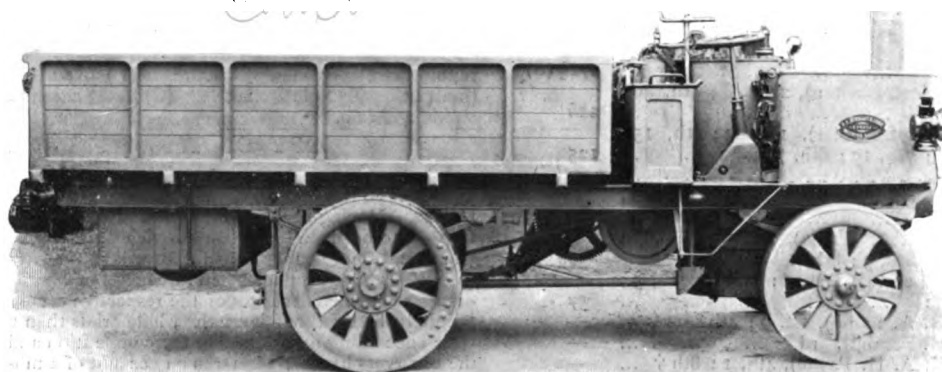
As this letter and the reply will be circulated to the Press in all parts of the world, we should be glad of a reply as soon as possible, and to have it considered before the distribution of prizes to-night.—Yours faithfully,

(Here follow the signatures of numerous owners.)



THE HINDLEY STEAM LURRY.

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THE HINDLEY STEAM LURRY.—Accessibility is the leading feature of this vehicle in which the engine is arranged alongside the driver's seat. The lorry has been built to carry a load of $2\frac{1}{2}$ tons, and has a platform area of about 60 square feet. The transmission is by a single chain to a live-rear-axle. Further particulars appear on this page.

A new type of steam lorry which has just been put on the market by Messrs. C. S. Hindley and Sons is illustrated on this page. Accessibility is the leading feature of its design, all the cocks and control levers being brought within easy reach of the driver. The engine, which is of the vertical compound type, is arranged just behind the boiler, alongside the driver's seat. The boiler is of the locomotive fire-tube type, and is top fired through a vertical chamber situated immediately in front of the engine. No stays are employed



THE *World's Work and Play* for the month of February is just to hand as we go to press. This particular number is almost entirely devoted to automobilism, and contains attractively-written articles on such subjects as "Spring in the Motor World," by the Editor, Mr. Henry Norman, M.P.; "Motor Cycle Camping," "The Motor Boat and its Future," "Petrol Motors on our Railways," and other automobile topics. A very attractive and pleasing feature is provided by the splendid portraits reproduced of Colonel Holden, Chairman of the Automobile Club, the Hon. J. Scott Montagu, M.P., the Hon. Arthur Stanley, M.P., Colonel Mark Mayhew, and Mr. Julian Orde, the club secretary. This number of the *World's Work* will probably also be remembered, in future, as introducing the Adams-Hewitt light car, in which the editor is evidently greatly interested, and which if it continues to bear out what his experience of it seems to show it to be, must be possessed of some very conspicuous merits.

in the boiler, as it is claimed that the special construction renders this unnecessary. Only one speed is provided, the engine driving through a single reduction gear to the chain sprocket countershaft, from which a single chain passes to the differential on the live-rear-axle. The gear ratio is arranged to give a normal speed of from 8 to 10 m.p.h. on the level, and it is stated that the engine, which works at 250 lbs. per sq. in. boiler pressure, is capable of taking its full load of $2\frac{1}{2}$ tons up an incline of 1 in 10.

WE are glad to find that our constant advocacy of the petrol motor for trams in districts where tram-lines exist as a cheap and effective, and in many ways superior, alternative to the expensive and often unsightly electric trams, is at length meeting with recognition. It is now proposed to give up horse traction for the trams in Shoreditch, but a difference appears to exist between the Shoreditch Borough Council and the London County Council as to the system to be adopted. Presumably the London County Council wants electricity. The Shoreditch Town Clerk, Dr. Robinson, has now proposed that tramcars propelled by petrol motors should be run on the tram-lines, a system of traction "which would avoid the excessive and difficult alterations required either by the overhead or the conduit electrical system." We trust Dr. Robinson's proposal may be afforded a thorough trial, as we feel convinced that, provided the motors are of reliable construction, it will prove a satisfactory solution of the problem.

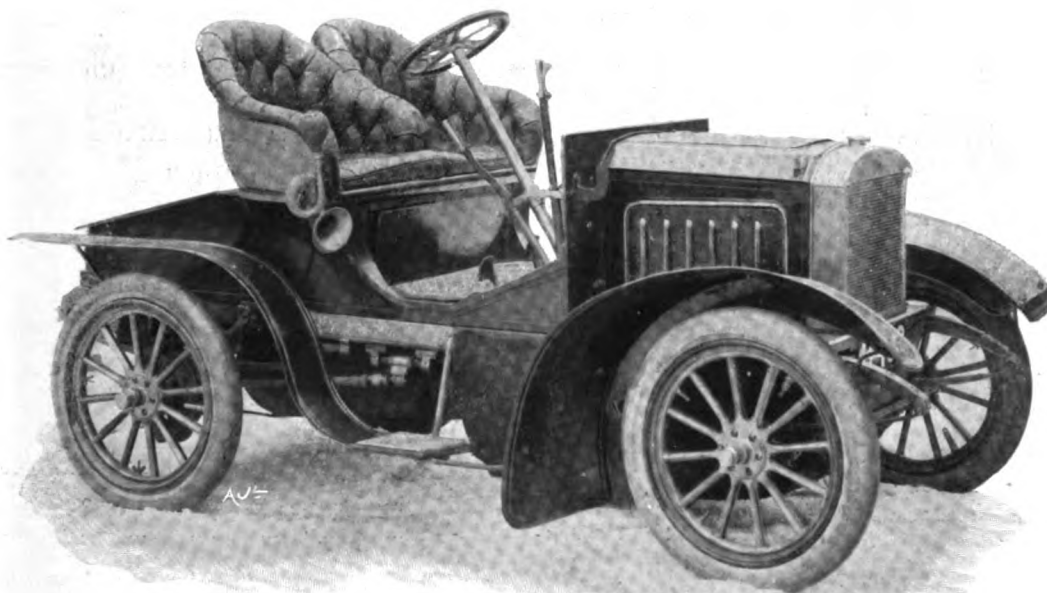
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THE BELSIZE—ALL BRITISH—PETROL CARS.

IN view of the great progress which continues to be made by the Belsize Motor Car and Engineering Company, of Manchester, and to the fact that the well-known firm of carriage builders, Messrs. W. Bath and Son, are now agents for the Eastern Counties, the pleasure vehicles manufactured by this Manchester firm of automobile builders are likely to become even better known generally than they are already in the North. The makers have recently considerably extended their operations, and are now turning out a variety of different types of pleasure vehicles. They have an extremely complete equipment of special machines in their factory—an idea of which can be obtained from the two views that we give—and have not only made a special study of petrol vehicle design, but also of the question of producing good cars at a low price. When visiting their factory recently, we were much struck with the excellence of the work that is being turned out by

3-cylinder car that was exhibited at the Crystal Palace last year, but although no radical alterations have been made in their design, and the new models follow the same general lines as one or other of those earlier ones, yet many minor improvements have been made since last year, and the illustrated description which we are now able to give, will doubtless be acceptable.

All the Belsize cars have "live" axles, and, with the exception of the two "Junior" models, they are driven by propeller-shafts and bevel gearing; the Belsize "Juniors" have the back axles driven by one central chain. The characteristic feature, however, of all the cars is to be found in the engine, for, in all sizes, the valves are mounted immediately above the piston instead of being fitted in the valve-chambers at the side. The inlet-valves on the larger types are, moreover, operated in such a way that they can be closed earlier or later during the suction stroke, at the will of



View of the 6-h.p. Single-Cylinder "Belsize Junior" Car.

them, and were also afforded an opportunity of witnessing the very satisfactory behaviour of their cars in practical use on the road. All the parts are made strictly interchangeable, and the system adopted throughout the works is thoroughly up to date. Quietness of running, and sufficiency of power to avoid the necessity of constant gear-changing, are particularly noticeable features of the 3-cylinder vehicle on which we travelled, in the worst of weather, and in many parts through deep snow, a distance of over 100 miles, and, so far as we could judge, all their other models are equally well calculated to thoroughly satisfy those requiring a comfortable, reliable, and durable vehicle.

The Belsize cars vary in power from the single-cylinder 6-h.p. Belsize "Junior," which is being sold at a remarkably low price, to the 6-cylinder 30-40-h.p. that is now being produced, while the intermediate models include the 12-h.p. twin-cylinder "Junior," the 18-24-h.p. triple-cylinder model, and a 4-cylinder car of 30-40-h.p. Our readers are already familiar with the construction of the smallest of these vehicles, as also of the

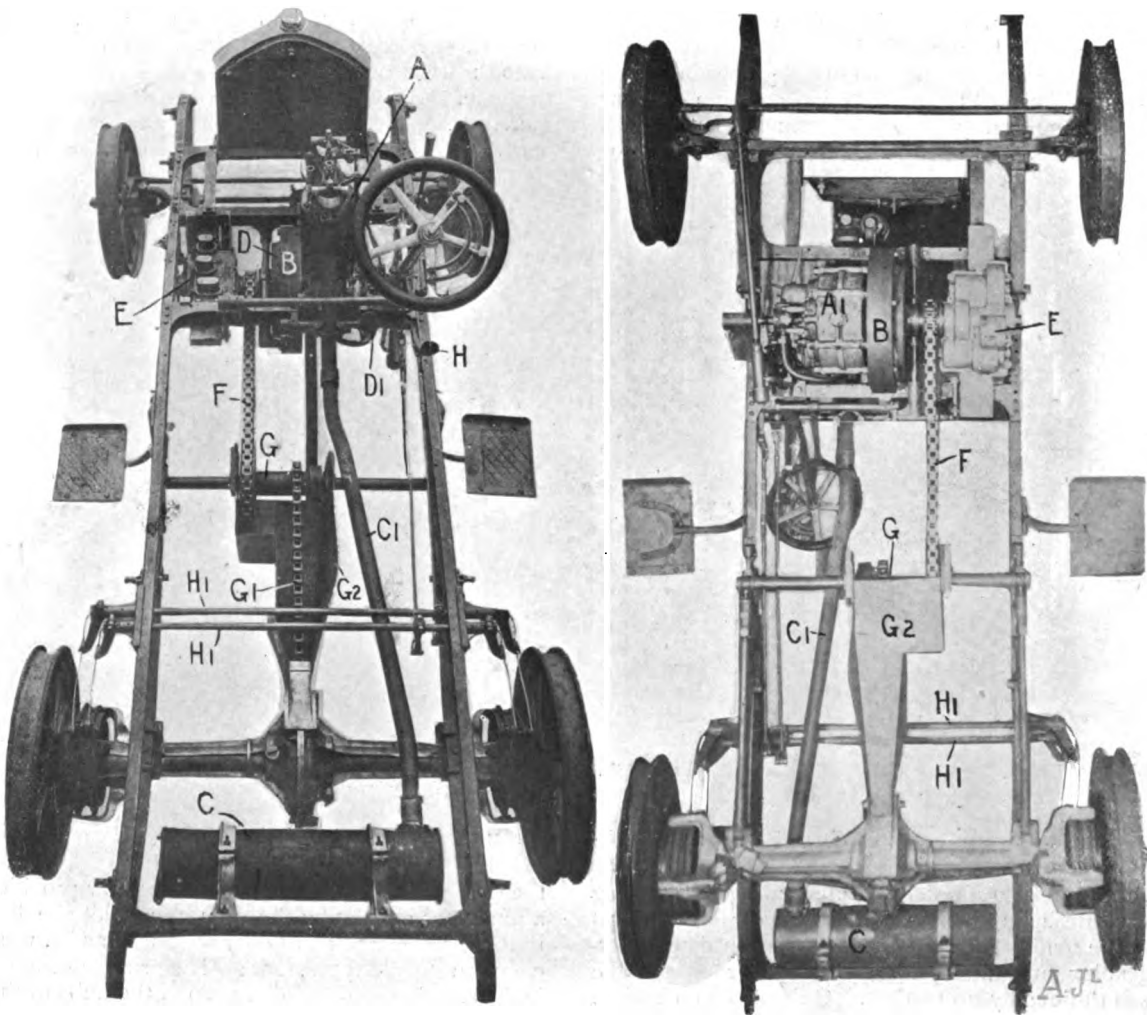
the driver, and the larger engines are now provided with a pump for circulating the oil through all the bearings in the crank-chamber. Other special features, which are common to all types, are:—The arrangement of both brakes so that they act direct upon the hubs of the rear wheels, the method adopted for attaching the side springs to the main frame, and the invariable employment of pressed-steel frames. There are, too, several other minor though interesting respects in which the Belsize cars differ from ordinary practice, as will be seen from the descriptions which we now proceed to give.

The "Belsize Junior" Models.

These little vehicles, which are either fitted with a single cylinder 6-h.p., or a twin-cylinder 12-h.p. engine, have been specially designed with the object of enabling them to be sold at a low price, although their construction is very substantial, and they are capable of withstanding a lot of continuous hard work. They are equipped either with two-seated or three-seated bodies,

which have very neat bucket seats, as seen in one of our illustrations. The arrangement of the mechanism is well shown in Figs. 1 and 2, which are, respectively, views from above and from beneath, of a single-cylinder chassis. The pressed-steel frame, which is carried on semi-elliptic side springs above each axle, is connected with the rear ends of the front springs, and with both ends of the back springs, by guide-blocks that are free to slide on short tubes instead of by the ordinary shackles, the guide-tubes being fixed beneath the side-members of the frame, and the sliding blocks being

flywheel is centrally placed between the side members of the frame, and there are also other flywheels, inside the crank-chamber, forming part of the built-up crank-shaft. The clutch, D, is of the internal cone type, operated by the foot-pedal, D', in the usual way, while between it and the gear-box, E, is the sprocket-wheel, from which the power is transmitted to the countershaft, G, by the chain, F. The sprocket is carried upon a sleeve that rides freely on the prolongation of the crank-shaft, but is locked directly to it by a jaw-clutch, inside the gear-box, when the top speed is in use. The main clutch is introduced



FIGS. 1 AND 2.—Views from above and beneath, respectively, of the 6-h.p. "Belsize Junior" Chassis.

secured to the springs. The length of the springs has been increased since last year, and the front axle is now of greater strength than it was, with roller-bearings for the road wheels. The stationary portion of the back axle is formed by two aluminium castings, and the live shafts that revolve inside it are made of nickel steel and have ball-thrust bearings.

It will be noticed that the engine is fixed in front, on the right side of the car, with its crank-shaft lying transversely, and that the shaft projects across into the gear-box, E. The engine has a single vertical cylinder, A, bolted to the crank-chamber, A', and the main clutch, D, is arranged inside the external flywheel, B. This external

flywheel is centrally placed between the side members of the frame, and there are also other flywheels, inside the crank-chamber, forming part of the built-up crank-shaft. The clutch, D, is of the internal cone type, operated by the foot-pedal, D', in the usual way, while between it and the gear-box, E, is the sprocket-wheel, from which the power is transmitted to the countershaft, G, by the chain, F. The sprocket is carried upon a sleeve that rides freely on the prolongation of the crank-shaft, but is locked directly to it by a jaw-clutch, inside the gear-box, when the top speed is in use. The main clutch is introduced

between the two halves of the crank-shaft, and it therefore completely disconnects the one portion from the other when disengaged. There are two independent lay-shafts inside the gear-box, one of which is employed for giving the second speed, and the other for the first and "reverse" speeds. Either of the three forward speeds or the "reverse" can be introduced by one of the long hand-levers that lies near the steering pillar, this lever being provided with a notched quadrant in the ordinary way.

The arrangement of the engine is in general respects the same as those of the larger models, with which we shall deal presently, so that it is unnecessary for us to

more than mention now that the cylinder has a bore of $4\frac{1}{8}$ in., a stroke of 5 in., and that it develops about 7-b.h.p. at 1,000 revs. per min. The extreme end of the crank-shaft (on the right side) is fitted to receive the starting-handle, which is usually carried in the tool box, and can be introduced through the socket provided for it. It will also be seen that the exhaust-box, C, is fixed across at the back of the frame, and that a very long exhaust-pipe, C', is led to it from the engine.

The 12-h.p. twin-cylinder engine is similarly fitted, in conjunction with the clutch and the gear-box, on the larger "Junior" model, but instead of having a built-up crank-shaft, it has an external flywheel only. The two cylinders are cast together, the bore and stroke of the cylinders are 4 in. and $4\frac{1}{4}$ in. respectively, and the power developed is about 12-b.h.p. at 1,000 revs. per min.

The intermediate countershaft, G, consists of a sleeve that runs on ball-bearings on a stationary tube, and is provided with two sprocket-wheels. The one sprocket is driven from the change-speed gear by the chain, F, and the other drives the back-axle by the chain, G', which, together with the countershaft, is protected by a light casing, G². The stationary tube forming the support of the countershaft, G, is fixed at its ends to brackets which enable the chain, F, to be tightened, and from which the radius-rods pass to the back-axle. One of these brackets is clearly visible in our illustration of the 6-h.p. car, and it will there be seen that it is carried upon a short horizontal shaft, the ends of which are secured to the underside of the main-frame, while the shaft itself has a screw-thread and lock-nuts for fixing the bracket in any desired position along its length. The radius-rods are also provided with a screw-adjustment, and thus the second chain, G', can be tightened independently, while the fact that the radius-rods are hinged to the countershaft prevents adjustments of the chain, F, from interfering with the tightness of the chain, G'. It will be noticed that the guides for the rear-springs are of considerable length to allow a large range of adjustment for both chains.

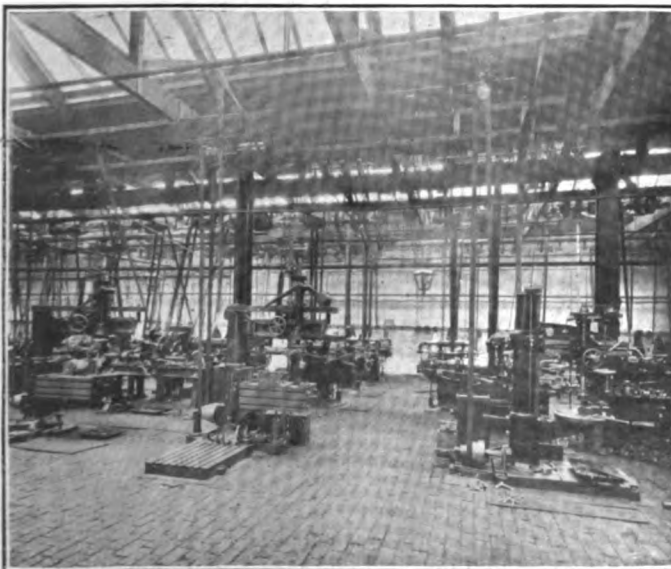
Two independent brake-bands encircle brake-drums that are fixed to each of the rear wheels. The two

inner bands, and the two outer, respectively, are simultaneously operated by compensating cables that pass through the transverse rock-shafts, H¹. One of these rock-shafts is connected with the pedal, H, and the other with the hand-lever that lies alongside the change-speed-lever in front of the driver. Both brakes thus act direct on the two driving-wheels, and no strain is imposed on the transmission-gear when they are applied.

These well-finished little vehicles have the levers and pedals conveniently arranged, and are very simple to drive. The change-speed-lever and the brake-lever being placed near the steering-pillar, instead of at the side of the car, render it easy to get in or out on either side, the two small hand-levers that act on the throttle, and vary the time of ignition, respectively, are fitted about the steering-wheel, and the pedals that control the clutch and the foot-brake are of what is commonly known as the "push" type. The electrical apparatus for the high-tension ignition system, as also the lubricator, are mounted on the dashboard, and the whole of the cooling water required for the cylinder-jacket is carried by the honeycomb radiator that forms the front of the bonnet; the water is circulated through the radiator by a pump of the gear-wheel type, driven direct from the crank-shaft.

Although constructed so as to be sold at a low price, every care has been taken to render the "Junior" models as far as possible complete miniatures of much larger and more powerful cars. Thus, for instance, an "irreversible" form of steering gear is fitted to them, the engine has an automatic governor for controlling its speed, and the road-wheels are of the artillery type. The wheel base and track are 6 ft. 3 in. and 4 ft. respectively, and the pneumatic tyres are 28 in. in diameter by $3\frac{1}{2}$ in. wide. The total weight of the 6-h.p. car is about 8 cwt., and of the 12-h.p., about $8\frac{1}{2}$ cwt. They are usually geared to run at normal speeds of 6, 12, and 25 m.p.h. when the engine is running at 1,000 r.p.m., and the petrol tanks, which are fixed under the driver's seat, have a sufficient capacity to enable them to run a distance of about 150 miles, on an average road, without replenishing.

(To be continued.)



Two Views in the Machine Shops at the Belsize Motor Car and Engineering Company's Manchester Works.

SPRING - WHEELS FOR MOTOR CARS.

(Continued.)

THE GLYDA RESILIENT HUB.

AMONG those inventions directed to the solution of what may be called the "spring wheel problem" that of Mr. Jackson, and now known as the Glyda Resilient Hub, has undergone a considerable amount of development since it was first given a practical trial. This spring wheel was first brought to our notice some months ago, and we are therefore able to give illustrations both of its original and present-day appearance.

The principle is most clearly illustrated by Fig. 1, which represents the early form of wheel. In this view the external flange has been removed so that the springs, which render the wheel resilient, are exposed, and the method of transmitting the drive from the hub to the wheel proper is also clearly shown. The drive is transmitted through one of the links, L—of which there are two, one for forward motion and one for reverse—and

dust cap, forms a complete unit, as it does in ordinary wheels, only in their case the flanges are fixed rigidly to the spokes. Below this is a view of the centre part of the wheel after the hub and springs have been removed. This view shows exactly so much as is rigid with the wheel proper, it will be noticed that the spokes are set in a steel housing, which would, in an ordinary wheel, form part of the hub, and it will be seen that this steel housing has inwardly projecting lugs for transmitting the drive, as will be explained later. The lower left-hand view represents the loose flange which has been removed from the far side of the wheel, and on which will be noticed the radial projections used in transmitting the drive. On the right of the centre illustration are three other separate views, of which the two lower ones are the reverse of the two lower views on the left of the centre illustration, except that in the centre view on the right the springs are seen in place within the housing.

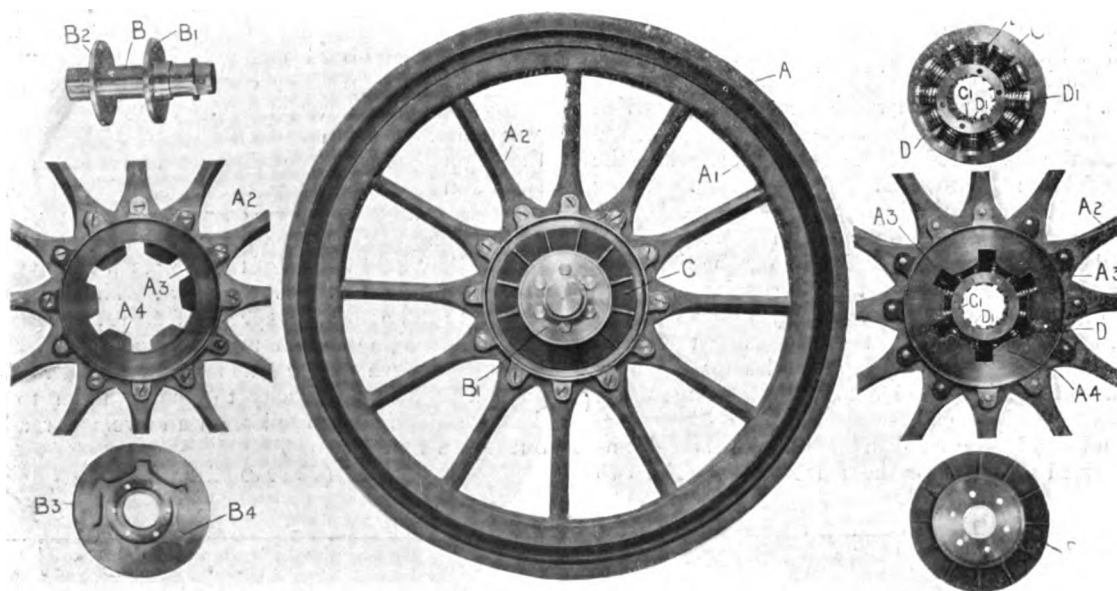


FIG. 2.—The Glyda Resilient Hub. View of the new type of wheel and its component parts. The complete wheel is shown in the centre, on the left is a view of the hub and two views showing the members of the jaw coupling now used in transmitting the drive, on the right are shown the springs and two reverse views of the driving members.

the links are slotted at the outer extremities so that they can automatically accommodate themselves to the relative motion between the inner and outer members of the wheel. No alteration in the principle affording the resiliency has been made in the present-day model, but the "mechanism" of the wheel has been rendered much more compact, and an entirely different form of drive has been adopted. The latest form of wheel is shown in Fig. 2, which also gives several views of the component parts. In the centre of this illustration is a view of the wheel complete, which gives a good idea of its general appearance. As can be seen it does not differ greatly in this respect from ordinary wheels owing to the neat design of the centre portion which contains the springs. On the left of the centre illustration in Fig. 2 are three detailed views from the front. In the top view is seen the hub proper, which, together with its loose flange and

A separate view of the springs, arranged on their guide-plate, is shown in the upper right-hand corner.

In the light of the illustrations in Fig. 2, the general principles of the wheel are almost obvious. It will be seen at once that the idea is merely to interpose a set of helical springs between the hub proper and the wheel proper, so that road shocks may be damped between the rim and the axle. The constructional difficulties of an application of such a principle are not great, as the following description of the simple parts in this wheel will show :—

The wheel proper consists of a tyre, A, mounted in its rim on the felloe, A1, which is supported by the spokes, A2, registering into the steel housing, A3. The housing, A4, is machined both inside and outside. The inside face supports the weight of the car, while the two flat sides take all lateral strains. It will be noticed that one

face of the housing, A³, is provided with inwardly projecting arms, or lugs, A⁴, which are solid with it, and are used for transmitting the drive as already mentioned.

Inside the housing is an inner member consisting of several parts, including the hub, which after being securely fastened together forms a complete unit. The hub, B, is hollow, and fits on the axle in the usual way. It is provided with two flanges, one fixed, B², the other loose, B¹. Besides these two flanges are two larger flanges, B³ and C, which slip over the hub, and lie inside the flanges, B² and B¹; the former, B³, is specially fitted for transmitting the drive, while the other, C, is arranged for carrying the springs; but both perform the supplementary duties of preventing any sideway movement between the wheel and the hub.

The flange, B³, is attached to the fixed flange, B², on the hub, B, and is provided with six claws, B⁴, on its inner face, which engage with the corresponding jaws, A⁴, on the housing of the wheel proper. When in place this jaw-coupling thus formed is a very slack fit, and provides ample clearance for the relative motion which must take place between the inner and outer members of the wheel when the springs are in action.

The springs, D, as has already been mentioned, are carried by the flange, C. The flange, C, is provided for this purpose with a sleeve, C¹, cast solid with it, which forms a seat of reaction for the springs, D. Usually twelve helical springs are employed in each wheel, and these are arranged radially around the sleeve, C¹, as shown. The springs are given a certain amount of initial compression, which is preferably sufficient to ensure all the springs keeping in contact at all times with both members of the wheel. Each spring, D, is mounted on a spindle or bolt, D¹, which is provided with a large head on its outer end, and is either threaded to take a nut or drilled to receive a cottar-pin at its inner end. The inner ends of these spindles pass through holes drilled for the purpose in the sleeve, C¹, and project a little on the inside, as seen both in Figs. 1 and 2. In Fig. 1 it will be noticed that the spindles are threaded, while in Fig. 2 they are drilled and fitted with cottar-pins. In either case, however, the object is the same, namely, to retain the springs in a sufficiently compressed condition for

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THE New York Madison Square Garden Hall has, it is stated, been secured for a period of four years by the syndicate controlling the Selden "master" patent. By this means it is hoped to further cripple all interested in automobiles in America, whether American or foreign, other than those who consent to come into the ring formed by this syndicate.

them to be easily put in place within the housing. The heads of the spindles, D, are slightly curved, so that when the springs are in place they make an even contact with the inner face of the housing. The centre part of the wheel then appears as shown on the right of Fig. 2, and also in Fig. 1; the nuts or cottar-pins are, of course, removed, so that the springs may have perfectly free play.

The member holding the springs is secured to the hub proper, B, by bolts passing lengthwise through the sleeve, C¹, and the flanges, B¹, B³, and B². It will be noticed that the flange, B³, recesses into the outside of the flange, B², while the inside of that flange is provided with a recess for receiving the free end of the sleeve, C¹, so that, when bolted up together, they form a solid unit, and if properly fitted should allow no shearing strain to come upon the bolts.

The sleeve, C¹, thus acts as a distance piece between the two large flanges, C and B³, which overlap the side faces of the housing, A³, when in place.

With the wheel thus complete it will be seen that the hub member—including the large flanges, B³ and C, with its sleeve, C¹—can move radially in any direction relatively to the wheel proper to deaden the road shocks between the rim of the wheel and the axle. At the same time, too, the flanges, C and B³, which fit up against the side of the housing, A³, prevent motion in any other direction.

It will of course be understood that whether

these wheels are used on cars having stationary or live axles, the power is transmitted to the hub proper, so that a certain amount of cushioning action is obtained when letting in the clutch. It is claimed that the springs, D, are of sufficient strength to give enough friction between the heads of their spindles, D¹, and the housing, A³, to take the drive normally, and that the jaw-coupling only comes into play when the torque is excessive.

Table of Reference Letters for the Glyda Resilient Hub.

A Tyre.	B ³ Driving flange.
A ¹ Felloe.	M ⁴ Driving claws.
A ² Spokes.	C Spring member.
A ³ Housing.	C ¹ Sleeve fixed to C.
A ⁴ Jaws on A ³ .	D Springs.
B Hub.	D ¹ Spindles for D.
B ¹ Loose flange on B.	L Driving links (old type).
B ² Fixed flange on B.	

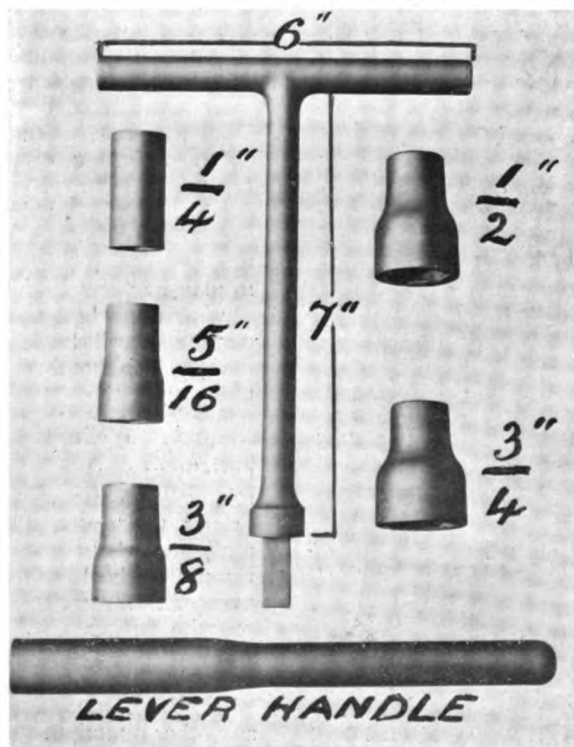
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It is gratifying to learn, officially, from the Great Eastern Railway Company report, that the directors are so satisfied with the results which have attended the experiments they have made with road motor cars between Lowestoft and Southwold that they have ordered ten additional cars, which are to be run in suitable districts in connection with the railway service.

A USEFUL TOOL.

MOTORISTS worthy of the name look to it that their tool kit is of equal excellence with the machinery of their car, and all such recognise the importance of possessing really good spanners. An ordinary spanner is a cumbersome article—on a car—and a bad spanner, however handy in form, is useless, so that the desideratum is obviously something which shall combine the qualities of lightness, small size, and great strength. These are the qualities claimed for the "Eureka" set of box spanners brought out by Mr.



The "Eureka" set of Box Spanners, designed by Mr. Edward Kennard.

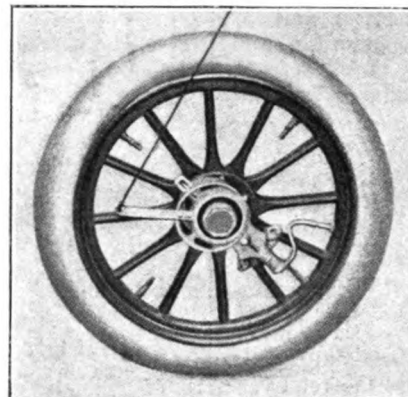
Edward Kennard, a well-known motorist whose practical experience has led him to fully appreciate the advantage of such articles. The set, seen in the accompanying illustration, consists of five interchangeable heads and a common stem, with an additional lever to telescope over the handle of the turnkey when it is necessary to increase the leverage. The heads are forged from a high-grade cast steel and are machined all over, the boxes being made to gauge, and the working surfaces carefully hardened to withstand rough usage. A similar set, having a smaller range, is also made for motor bicycles.

KING LEOPOLD of Belgium was sufficiently interested by his opening visit to the Brussels Salon to again patronise the Exhibition during last week.

THE International Exhibition for automobiles and sports generally, proposed to be held in France in 1907, to which we drew attention in THE AUTOMOTOR JOURNAL on December 24th, already appears to be making strong headway, and an influential committee has been officially appointed, with M. Gervais, Deputy for the Seine, as president, to enquire into its possibilities, and draft out a scheme of organisation.

AN AUTOMATIC TYRE PUMP.

ANYTHING to save the manual labour of pumping up a motor car tyre will probably receive the attention of a large number of automobilists. The "curiosity" illustrated herewith is an American invention, known as the "Hibbard" pump, and is designed to be attached to and carried by the road wheels of the car. While thus fixed, it may be used at will to pump up the tyre as the car is running, and its capacity is said to be sufficient to even enable it to compensate continuously for a small puncture, and so allow the car to be driven some distance if it is particularly undesirable to stop and repair the damage at once. The action of the pump is obvious; the pump barrel is fixed to one of the spokes, and the plunger is worked by an eccentric carried on the hub. Ordinarily both the sheave and strap of the eccentric revolve with the wheel, but the sheave, or internal member, may be held stationary at will by means of a cord which is attached to the body of the car. When this is done the pump delivers air to the tyre, an automatic device stopping its action as soon as the pressure exceeds any desired limit. When only one pump is carried, this may be temporarily fitted to any wheel, which, when "jacked" up off the ground and spun round by hand, can also be made to accomplish the desired result of inflating the tyre.



THERE is no more considerate driver than Mr. S. F. Edge, and no one more fully recognises the vast importance to the automobile movement of inculcating thoughtfulness for the rights and conveniences of other road users than he does. In future, therefore, all the cars which his firm turn out will have on the dashboard the subjoined card, which, as Mr. Edge says, can do no harm, and might "well be adopted without disadvantage by every maker, manufacturer, or dealer in this country." We quite agree with him on this point, and the presence of the cards on the dashboards will certainly go a long way to disarm the more virulent "Juggernautists" when they recognise the excellent precepts which are constantly before the very eye of the driver:—

INSTRUCTIONS TO DRIVERS.

Passing cyclists and horse-drawn vehicles—Give the maximum space possible.

Passing restive horses—Use the utmost consideration, even to stopping the engine if necessary, although no hand may have been held up. On narrow parts of roads, cross roads, corners, and bridges, drive slowly and with caution.

Passing through towns and villages and at roadside residences—Go slowly, so as not to fill houses and cottages and cover gardens with dust, as well as for the safety of the inhabitants and their dogs, &c.

Passing pedestrians in wet weather—Take care not to splash them.

THE BIRMINGHAM MOTOR SHOW.

ALTHOUGH none of the provincial automobile exhibitions in this country—not excluding even those held in the very heart of the industry—can naturally compare with any of the great London shows, yet that which was opened at the Bingley Hall, Birmingham, by the Lord Mayor of that city, last Saturday, is very fairly representative, and has been well attended during the week by the public of the Midlands. At the opening ceremony, the Lord Mayor was requested by Mr. H. Austin—the well-known manager of the Wolseley Company—to declare the Show open, and the few short speeches that then followed showed the importance that is attached to the new industry by the authorities of that city. The majority of makers whose cars are in evidence are represented by their local agents, but several of the well-known English builders, and one or two of the London agents for foreign cars, have their own stalls in the hall.

As might be expected, the Wolseley Company's exhibit is quite one of the most comprehensive and interesting.

seater, with a wide seat for the driver and his companion, is of very much the same design as the Rover 8-h.p. car. The engine, the clutch, and the transmission-gear are arranged in the same way, and there are three forward speeds available, as well as a "reverse." With a 6 ft. wheel base, a 4 ft. track, and 28 by 2½-in. tyres on its wire-spoke wheels, this little machine weighs about 6 cwt., and is geared to about 24 miles per hour at normal engine speed—1,200 revs. per min. Except that the rear-axle-casing is separate from the gear-box—a universally-jointed propeller-shaft being substituted for the rigid shaft—the 8-h.p. model is practically the same as last year, and is supplied either with a two, three, or a four-seated body, as required.

The Alldays and Onions light cars now have a wheel-base of 6 ft. instead of 5 ft. 6 in., a simplified gear-box, internal expanding hub brakes, and an improved circulating pump. Either a 7-h.p. or an 8-h.p. engine can be fixed to the channel frame, the larger having a 4½-in. by



BIRMINGHAM AUTOMOBILE SHOW.—General view of Bingley Hall where the Exhibition was held during the current week.

They not only show typical samples of their various well-known cars, but also have on view an 8-h.p. chassis of their new type, and a chassis of their popular 6-h.p. model. The Belsize Company, the Rover Company, and Messrs. Alldays and Onions, are amongst the other English makers who are exhibiting their own pleasure cars, while Daimler, Napier, Star, and Argyll vehicles are shown by local agents. The Belsize exhibit includes one of the 3 cylinder 18-24-h.p. and a twin cylinder "Junior" model, both of which are described by us in a special article that deals with this make of vehicle in another column.

Quite one of the sensations of the Show is attributable to the Rover Company, who, in addition to their 8-h.p. light car, have on view for the first time a 6-h.p. vehicle, which they are putting on the market at a hundred guineas. This little car, which is essentially a two-

4½-in. cylinder, while the former has a cylinder that is half an inch smaller in bore.

A fine-looking 28-36 h.p. Daimler car is exhibited by Messrs. Heath and Co., who also show sample De Dion and Darracq vehicles, and a 9-h.p. Corre chassis. The Corre model has a tubular frame, is of the live-axle type, and has the radiator arranged so as to form the sides of the bonnet. The Napier car on view is to be found on the Newey's Midland garage stall, as also is a Star chassis and a De Dion car, while the 10-12-h.p. Argyll vehicle is shown by the Birmingham Motor Car Company. The chief feature of Captain Deasy's stall is one of the well-known Martini vehicles, while close to it we noticed a Baby Siddeley and a Baby Peugeot. Other exhibits include those of the London Motor Garage Company—a 4-cylinder 12-h.p. Pipe—and of the Beaufort Company.

One of the few cars that is quite new to the English market is the "Queen" petrol vehicle, which is of the American light type, with two opposed cylinders, and is shown by Messrs. Horner and Sons—this firm also exhibiting the Diamond tyres for which they hold the agency in this country. The "Queen" car is of 12-h.p. with cylinders of $4\frac{1}{2}$ -in. bore and $4\frac{1}{2}$ -in. stroke. Other tyre exhibits include those of the Shrewsbury Challiner Company, and of Moseley and Sons, while the well-known non-skid devices of the Wilton Cox Company and Messrs. Grose are shown by those firms. Of a specially attractive nature are the stalls of the Vacuum Oil Company, and of Messrs. Dunhill, the former being tastefully decorative in character, and the latter being



THE GORDON-BENNETT CUP RACE AND THE GRAND PRIX.

We publish below the reply of the Automobile Club de France which has been vouchsafed by that body to the protest sent to them by the A.C.G.B.I., and which was reproduced in our last week's issue. We are giving the document in the original French in order that it may be an absolute record of the position adopted by the French club. It will be observed that, while couched in courteous terms, the reply fully admits the correctness of the statements which have been made in regard to the suggestion of running the Grand Prix and the Gordon-Bennett Race at one and the same time, on which the protest of the British club was based. The French club at the same time maintain that they are not introducing any innovation, as already on two occasions the Gordon-Bennett Race has formed an accessory to another event, and that out of five times when the Cup has been competed for, it has only three times been a separate race. The reply adds that it is owing mainly to French competition that the Gordon-Bennett Race has attained its present pre-eminence, and that in spite of this pre-eminence, the Gordon-Bennett Cup cannot be regarded, as stated by the British Club, to be the "blue ribbon" of automobile sport, owing to the fact that manufacturers are insufficiently represented; that the object of the founder was to excite emulation between the great automobile clubs, and that it would be going beyond his intentions to confer upon it a greater significance than it had at first. After claiming that they have considered the question with the most sporting impartiality, the Automobile Club de France declares that the Grand Prix includes all the conditions which will make manufacturers of all countries delighted to compete in it, and concludes by saying that, after having read this letter, the British Club will recognise that the French Club is not in any way introducing an innovation, but merely returning to the arrangements which prevailed in 1901 and 1902.

It will thus be observed that, though the letter affirms the determination of the French Club to adhere to the arrangements it has adopted, it does not in any way meet the arguments of the protest to which it is put forward as a reply.

The following is the original text of the official reply of the A.C. de France to the protest of the A.C.G.B.I. :—

" Paris, le 19 janvier 1905.

" Monsieur le Président,

" Nous avons bien reçu votre honorée du 12 janvier et c'est avec une délicate attention que nous avons pris connaissance de son contenu.

" Il est exact, comme vous l'avez lu, que l'Automobile Club de France vient de créer une nouvelle course, sous le nom de 'Grand

both extensive and comprehensive, while, amongst the exhibits of accessories, mention should be made of the lamps shown by the Twentieth Century Manufacturing Company, and of the special pumps, switches, and commutators exhibited by the Aston Motor Accessories Company.

Amongst the exhibitors in the heavy vehicle section quite a large number of well-known firms are represented. Those showing steam tractors or luries include Messrs. Jesse Ellis and Co., the Bristol Wagon Works, Messrs. Fodens, the Yorkshire Steam Wagon Company, James Robertson and Son, Messrs. Clayton and Shuttleworth, and Messrs. Wallis and Stevens.

Prix de l'Automobile Club de France' et que, suivant certaines règles et conditions, cette épreuve internationale sera disputée le même jour et sur le même parcours que la Coupe Gordon-Bennett.

" Nous sommes surpris que cette nouvelle ait ému l'Automobile Club de Grande-Bretagne, au point de donner lieu à une protestation de sa part, car, si vous voulez bien vous le rappeler, il n'y a dans notre décision aucune innovation, puisque deux fois déjà, en 1901 et en 1902, la Coupe Gordon-Bennett a été courue accessoirement pendant les deux épreuves principales qui étaient Paris-Bordeaux et Paris-Vienne et nous estimons que le résultat n'en a pas été le moins du monde faussé et vous vous souviendrez que c'est justement dans l'épreuve Paris-Vienne qu'une voiture anglaise a rapporté le trophée en Angleterre.

" Si nous nous reportons aux années antérieures, nous voyons donc que la Coupe, qui a été courue cinq fois, a été courue trois fois seule, la première, la quatrième et la cinquième, tandis qu'elle a été courue pendant, une course deux fois, la deuxième et la troisième; ceci n'a d'ailleurs jamais changé la nature des clauses d'engagements. Il n'y avait donc pas lieu, comme vous le dites, de vous prévenir avant le 31 décembre 1904, puisque cette précaution, et avec raison d'ailleurs, n'avait jamais été prise auparavant.

" Nous croyons qu'il nous est permis d'affirmer que nulle part comme à l'Automobile Club de France il n'a été donné des preuves d'intérêt aussi marquant à la Coupe Gordon-Bennett; nous en avons créé le règlement et c'est grâce à notre concours persévérant qu'on peut dire que cette épreuve est arrivée à la notoriété actuelle. Nous pensons donc que nous sommes bien placés pour dire que, malgré toute son importance, l'épreuve de la Coupe Gordon-Bennett ne peut pas être considérée, comme vous le dites, comme le 'Blue Ribbon' du sport automobile. Par suite même des conditions de son programme, les fabricants y sont trop insuffisamment représentés et se trouvent désavantagés les uns vis-à-vis des autres. Il ne faut pas oublier que, dans l'esprit du donateur, la Coupe Gordon-Bennett avait été spécialement faite pour exciter l'émulation des grands clubs automobiles les uns vis-à-vis des autres et se serait sorti de la voie tracée par lui que de donner à cette épreuve une signification qui, au début, ne lui a jamais été attribuée.

" Croyez bien que nous jugeons la question avec la plus sportive impartialité et nous estimons qu'une épreuve remplissant un programme comme celui du Grand Prix de l'Automobile Club de France réunira vraiment toutes les conditions exigibles pour constituer une course que tous les fabricants de tous les pays seront heureux de disputer et pourront être fiers de gagner, car cette victoire aura été obtenue avec des armes rendues équitablement égales.

" Nous espérons que vous voudrez bien lire attentivement notre lettre et nous sommes sûrs qu'ensuite vous serez pénétrés de l'idée que, contrairement à votre opinion première, l'Automobile Club de France, en prenant les décisions qui vous ont émus n'a fait aucune innovation et s'est bornée à remettre en vigueur les dispositions précédemment appliquées en 1901 et 1902 et qu'en créant le Grand Prix, il a bien mérité de tous les pays où la nouvelle locomotion est en honneur.

" Nous sommes donc convaincus que la Grande-Bretagne ne nous ménagera ni son appui ni ses encouragements.

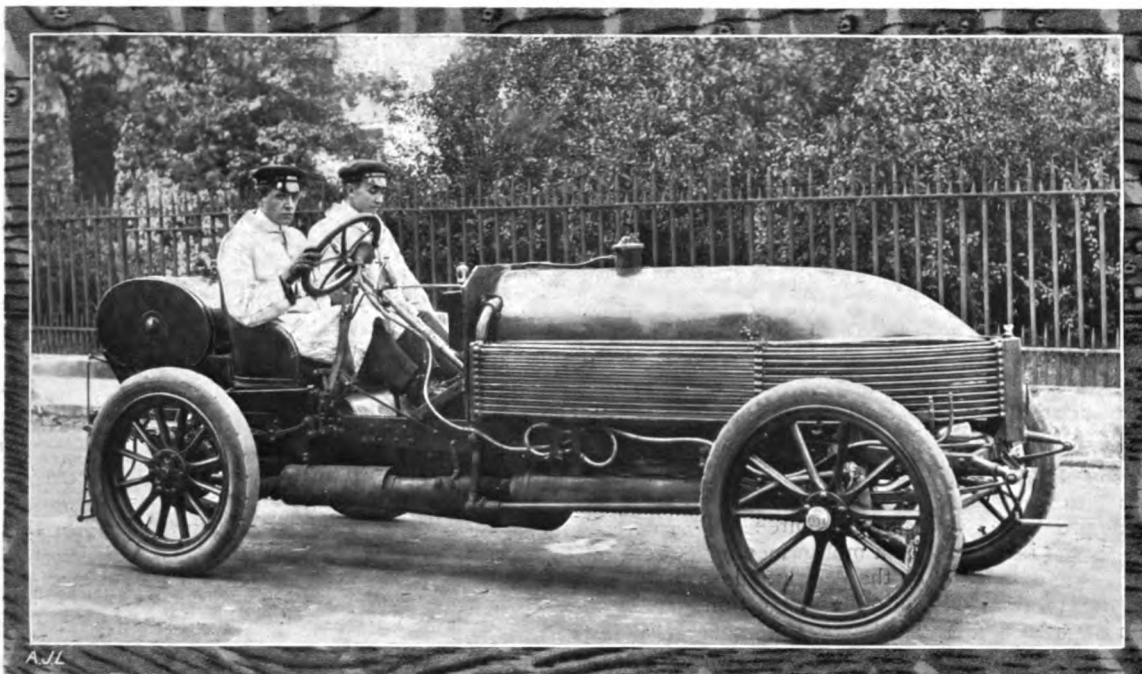
" Comme vous le dites très bien, nous avons toujours marché la main dans la main avec l'Automobile Club de Grande-Bretagne et nous avons le ferme espoir qu'il continuera à en être ainsi dans l'avenir.

" Veuillez agréer, monsieur le président, l'expression de mes sentiments les plus distingués.

Le président,

" BARON DE ZUYLEN DE NYEVELT. "

RACES, RECORDS, AND TRIALS.



Mr. Arthur Macdonald and the 6-Cylinder Napier Car with which he, on Tuesday last on the Ormond-Daytona Beach, made a new World's Record for 5 miles in 3 mins. 17 secs. = 91.37 miles per hour.

ORMOND-DAYTONA RACE MEETING.

For the long list of events down in the programme, 275 entries were received, representing 45 different makes of cars.

Following Mr. H. Bowden's attempts at speed records made on the beach prior to the opening of the meeting on Monday last, a number of other crack racing men with their cars have been endeavouring to bring down the times for the mile, amongst these being Edward Thomas and Hawley, the latter being officially credited with 5 miles in 3 mins. 11 secs., beating the records made on the beach of last year. Unfortunately, a very distressing accident occurred on Sunday last, whereby an intense gloom was thrown over the whole of those connected with this important meeting. Mr. Frank Croker, the well-known amateur racing man, and a son of Mr. Richard Croker, was attempting to establish a speed record on a Simplex car, and whilst trying to avoid a motor cyclist who suddenly crossed the track in front of him, came completely to grief. In endeavouring to avoid the collision Mr. Croker steered for the water, with a sudden twist, when one of the tyres catching in the sand the machine was completely overturned, ultimately, after a double somersault, landing upside down in 3 feet of water. Mr. Croker was thrown out a considerable distance, sustaining severe injuries, including a broken thigh, several ribs, &c., to which he subsequently succumbed. His French chauffeur, Raoul, was unfortunately pinned under the machine in the water, and was found to be already dead when extricated. The motor cyclist who was apparently the cause of the hideous accident was fortunate enough to come off with a broken

leg. Mr. Frank Croker will be remembered by many friends as an extremely delightful companion and a splendid driver. He drove the 75-h.p. Simplex car in the Vanderbilt Cup Race, and we are able, by the courtesy of Mr. Frederic Coleman, to give this week a picture of Mr. Frank Croker with his chauffeur on the car during that event.

On Sunday Mr. Macdonald on the 6-cylinder Napier had a turn, and is credited with the remarkable speed of 34 secs. for the mile, which, had it been officially timed, would have been a new world's record for the distance, it giving a speed of 105.88 miles (170.39 kil.) per hour. It will be remembered that at the Gaillon Hill-Climb Mr. Macdonald, when the car was admittedly not doing its best, was only two-fifths of a second behind the best times of the big French cars. We look forward, therefore, with confidence to the official results for record times from Mr. Macdonald on this splendid Napier production during the present meet on the Ormond-Daytona Beach.

New World's Record by the 6-Cylinder Napier.—We learn by cable that on Tuesday afternoon Mr. Macdonald duly, as anticipated, justified the confidence placed in him by scoring a new world's record on the 6-cylinder Napier car on the Ormond Beach, by covering five miles in the marvellous time of 3 min. 17 sec., equal to an average speed of 91.37 miles (147 kiloms.) per hour. This beats all previous records for the distance, W. K. Vanderbilt's previous record on the same course, last January, with a 90-h.p. Mercedes, being 3 min. 31½ sec.



Mr. F. C. Hathaway, who has done so much in promoting automobile racing on the Ormond-Daytona Beach, and the popularisation of automobilism in Florida generally, sends us the above amusing photo, which shows a quartet of young alligators in automobiles on these celebrated sands. Mr. Hathaway humorously dubs them "autogators."

Brighton Motor Meeting.—Three weeks ago we announced the holding of a motor meeting at Brighton during the present year by the Automobile Club in conjunction with the Brighton Corporation, and also announced the date selected as July 19th. For the first time at Brighton, official announcement of this fact was made on Saturday last by the Mayor, Alderman Blaker, the occasion being a commercial travellers' dinner. There will be three days' motor racing, commencing July 19th, and Saturday, April 22nd, will be devoted to motor launch competitions, making altogether a four days' meeting. The natural fitness of Madeira Road, where the speed events are to take place, can be well gauged by the photographs which we published in our two issues of January 7th and 14th respectively.

THE Brighton Motor Week has every prospect of being an annual affair, with the hearty co-operation of the Mayor of the town. Mr. Forbes, the general manager of the London, Brighton, and South Coast Railway, is prepared to use his best efforts to promote the success of the meeting, and we are glad to know that the Mayor has sounded a warning note to the boarding-house and hotel keepers, &c., in their own interests to see that their charges are made as reasonable as possible to the large number of visitors who will no doubt flock into the town in connection with the event.

Motor Van Trials.—It has been decided by the A.C.G.B.I., in response to the suggestion of the Industrial Committee and the Society of Motor Manufacturers and Traders, Limited, to extend the 30 days' Reliability Trial of light motor vans so as to embrace the heavy type of commercial vehicle. The classification of the heavy cars will be as follows:—Class A, vehicles designed to carry a load not exceeding 5 cwt.; B, 5 cwt. to 10 cwt.; C, 10 cwt. to 1 ton; D, 1 ton to 2 tons; E, 2 tons to 3½ tons; F, 3½ tons to 5 tons; G, 5 tons to 6½ tons; H, 2 tons to 3½ tons, and drawing a loaded trailer; J, 3½ tons to 5 tons, and drawing a loaded trailer; K, 5 tons to 6½ tons, and drawing a loaded trailer. The light vans will cover the following distances daily: Class A, 100 miles; Class B, 80 miles; Class C, 60 miles; Class D, 40 miles. It is proposed that the commencement of the trials shall be postponed from April to August 19th.

5,000 Miles Reliability Trial.—The 12-h.p. 2-cylinder Siddeley car continues its successful test of covering 5,000 miles without any material trouble under the regulations and observation of the Automobile Club. The third week was completed last Saturday, when the total mileage was 2,841½. Continuing our official record of its performances since Tuesday, January 17th, the following particulars bring the trial up to date at the time of going to press:—

Wednesday, January 18th.—Worthing *via* Arundel and Bury Hill. No involuntary stops. Distance 148 miles.

Thursday, January 19th.—Folkestone *via* Wrotham Hill and Maidstone. No involuntary stops. Distance 151½ miles.

Friday, January 20th.—Brighton *via* Westerham Hill, Lewes and Worthing. No involuntary stops. Distance 157½ miles. New front wing stay fitted on off side.

Saturday, January 21st.—Southampton *via* Egham Hill, Basingstoke and Winchester. No involuntary stops. Distance 151 miles.

Monday, January 23rd.—Margate Road *via* Maidstone and Detling Hill. No involuntary stops. Distance 151½ miles. Inlet and exhaust valves ground in. Off side driving wheel cover taken off and replaced by off side front wheel cover. Cover originally used on near side driving wheel, which was repaired after 841½ miles, fitted on off side driving wheel (front). Total life of off side driving wheel covers 2,993 miles, total distance without trouble, 2,730 miles.

Tuesday, January 24th.—Southsea *via* Guildford and Hindhead. Distance 148 miles. Tyre burst at Guildford. No involuntary stops. Total distance 3,141 miles. Total consumption 189 gallons, a new bolt on the pump, and a new lock nut on commutator chain. Near side cover has burst altogether after covering 2,265 miles.

2,000 Miles Commercial Vehicle Trial.—On Saturday last the Straker-Squire Public Service chassis with Trial body, running under the regulations and observation of the Automobile Club, completed its ninth day's run. Dead load of lead carried on floor of body equivalent to 25 passengers of 11 stone each. We gave extracts last week from the Official Observer's record sheets up to January 17th. Since then, up to press time, the following is the official daily report:—

Wednesday, January 18th.—Great North Road. No involuntary stops. Distance 100 miles. Changed 4 plugs, 2 broken gauge glasses on tank and lost axle cap replaced. New switch fitted and water union tightened.

Thursday, January 19th.—Banbury Road. No involuntary stops. Distance 101 miles. Wires to new switch connected up. Foot-brake adjusted and new split pin fitted in off side chain.

Friday, January 20th.—Bath Road. No involuntary stops. Distance 100 miles. New split pin fitted in each side-brake.

Saturday, January 21st.—Exeter Road. No involuntary stops. Distance 100 miles. Two bent pins in side-brakes replaced. Foot-brake adjusted.

Monday, January 23rd.—Oxford Road. No involuntary stops. Distance 100 miles. Sprag adjusted. Adjusted length of gear shifting rod in back gear-box.

Tuesday, January 24th.—Coventry Road. Distance 99 miles. No involuntary stops. Total distance up to date, 1,103 miles. Accumulators changed, 1 plug changed. Total petrol used 151 gallons. Total distance since last involuntary stop, 803 miles.

The Grand Prix of the A.C. de France.—Some weeks ago we gave the basis of the rules governing this new international event. These have now been confirmed officially in all particulars, and for the benefit of our readers we now give a *résumé* of the formal rules as issued last week. Apparently these are only intended to apply to 1905, in many respects, as it is obvious a yearly revision might be necessary with the variations in trade done, and the change of possession of the Gordon-Bennett Cup would also affect the rules materially:—

Summary of the Rules.

1. The trial will be held annually.
2. For 1905, and in other years, if possible, it will be run concurrently with the Gordon-Bennett Race.
3. *French Cars.*—The first fifteen cars in the Gordon-Bennett Eliminating Trials will be chosen to represent France in the Grand Prix, and no extra entry fee will be charged them. The first three of the above fifteen cars will be the representatives of France in the Gordon-Bennett Race.
4. If less than fifteen cars finish in the French Gordon-Bennett Eliminating Trials, then that number shall be completed by admitting the necessary cars among those which had entered upon the last stage when the trials were closed.
Three supplementary timekeepers will be stationed on the route for this purpose.
5. *Foreign Cars.*—Foreign competitors will be admitted by invitation only.
6. Countries will be invited to send competitors in proportion to the value of their automobile industries.
7. The respective limits for the various foreign countries under consideration is as follows:—Germany 6, England 6, Italy 3, Switzerland 3, Austria 3, U.S.A. 3, Belgium 3; total foreign cars, 27.
8. Foreign cars entered for the Gordon-Bennett are included in the above numbers.
9. Foreign clubs can receive the invitation, to which they have a right, on application to the A.C.F.
Not more than three cars of the same make may be entered by any foreign country.
10. The entry fee for the Grand Prix is 5,000 francs, in addition to any fee which may be required for the Gordon-Bennett Race.
11. Any car running in the Gordon-Bennett and not entered separately for the Grand Prix will not benefit by the awards for this latter event should it be the winner of the former race.
12. Not more than three engines or mechanisms manufactured under the same licence or bearing the same names may be entered. This rule applies to all cars entered, without distinction of nationality. The judges reserve the right of deciding the respective numbers of cars to be entered by firms manufacturing under the same licence.

13. Should it be discovered that the above rules disqualify certain entries, then their respective clubs may replace such cars within a specified time.

14. Entries must be sent to the Commission Sportive de l'Automobile Club de France, to arrive not later than 6 p.m. on the 1st of March.

15. Entries unaccompanied by the entry fee will not be considered, and all entries are subject to the approval of the Commission, which will be given within one month of the closing date.

16. After the closing date no changes in the entry list may be made except under Rule 13.

17. Cars nominated to run in the Gordon-Bennett Race will start first and according to the rules of that race.

The order of starting the other cars will be determined by ballot, without distinction of nationality. The time interval between starting each car will be decided later and will depend on the total cars starting.

18. The weight limit (empty) is 1,000 kilogs., with an allowance of 7 kilogs. for a magneto if employed.

19. Date, time, and place of the weigh-in to be given to those interested later.

American Records.—The wonderful records which have been reported and accepted in America, especially those of Barney Oldfield, have from time to time been challenged both in America and on the Continent, it being suggested that the method of timing was very lax. Recent advices from the United States state that some of the records of Oldfield are being officially questioned, as well as some of the Kiser mile records. It is quite possible that these may be revised and officially rejected by the American Automobile Association, particularly the one said to have been made at Denver of 51½ secs. Oldfield now states that, although his friends said he had made this time, he never claimed it, although he claims that he covered the mile on the track in 53½ secs. on the same day. At the same time, by way of a *tu quoque*, he states he regards the record times which are alleged to have been made on the Ormond-Daytona Beach as equally open to doubt as several of his own which are impeached.

AN international competition for voiturettes is announced to be held in France during the coming season, under the auspices of *L'Auto*.



Photo by Mr. Frederic Coleman

Mr. Frank Croker, and his chauffeur, driving his 75-h.p. Mercedes Simplex Car in the Vanderbilt Cup Race on Long Island in October last. As we record on page 109, Mr. Croker and his chauffeur were fatally injured in an accident on Ormond-Daytona Beach, in endeavouring to avoid a motor cyclist, whilst trying for a new speed record.

A.C. de France Tourist Car Trial.—In connection with this trial the route to be followed in the competition will probably be—starting from the Paris club-house—Tours, Royan, Aurillac, Avignon, Digne, Grenoble, Vichy, and Fontainebleau. The latter part of September will probably be the date for the trials, which will last about twelve days.

THE German club, it is announced, determined on Tuesday night not to take part in the Gordon-Bennett Race if run at the same time as the Grand Prix. This is only what we expected. From the first, in spite of the statements made by the French Press that the German club strongly approved the decision for a dual race, we pointed out that those behind the scenes on the contrary knew that the German club were strenuously opposed to any such thing. Following this decision, possibly the last has not even now been heard in regard to the two races being run together.

THE first entries received for the Gordon-Bennett French Eliminating Trials and the Grand Prix are three cars from Messrs. Panhard and Levassor, to be driven respectively by Messrs. Heath, H. Farman, and Teste, a "C.G.V." car to be driven by M. Girardot, and three De Dietrich cars driven by M. M. Gabriel Rougier and Duray.

In connection with the automobile week arranged during the Liège Exhibition, a novel event is to be run off. This will consist of racing over a distance of 2 kiloms., in which the cars will be timed for three distinct events. The cars will start standing, and will finish at rest at the end of the 2 kiloms. During the run the times will be taken three times, viz., (1) for the half-kilometre standing start, (2) the flying kilometre in the centre, and (3) for the last half-kilometre with a flying start but with a "standing stop." Some good prizes are to be offered.

AN interesting attempt to encourage new manufacturers of cars to take part in competitions, with a chance of not being entirely overshadowed by the well-known and successful competitors at most of the meetings on the Continent, is proposed by M. Baron de Crawhez and M. Houben. They hope to arrange for a competition during the present year, which will consist of a race reserved entirely for constructors who have hitherto not taken part in any of the big international races. All constructors who enter cars for the Paris Grand Prix and the Circuit des Ardennes will be debarred from competing. The distance will be about 400 kiloms. in the neighbourhood of Namur and Arlon, and an entrance fee of 5,000 or 10,000 francs per vehicle is suggested.

THE A.C. of Austria are arranging for a tourist car competition during May over a distance of 600 to 800 kiloms. In this the chief point taken notice of will be regularity in running, and other elements governing the awards will be average speed, speed on hills and over a measured kilom., fuel and water consumption, comfort of the carriage portion, price of chassis, &c.

Testing Apparatus Competition.—Our contemporary, *L'Auto*, has announced yet another competition to take place under their auspices. They intend to hold a test of devices suitable for measuring the power available at the driving wheels of cars. On page 87 of our last issue we illustrated the apparatus employed by the White Steam Car Company which is used for this purpose, so that our readers can see at a glance what the nature of the competition will be. It is, of course, not the car

which is to be tested, but the apparatus itself, and marks will be awarded according to its accuracy, adaptability, and substantial construction. The trials will take place at the laboratory of the A.C.F., and will be conducted by a jury of competent engineers.

The idea is to encourage the production of a simple and efficient device which can be readily employed on any vehicle to give the actual horse-power which such vehicle has available at the driving wheels. It is suggested that such a device might offer a solution to the horse-power difficulty which is experienced in classing cars in other competitions. All the cars entered could be previously tested by the authorities, who might in this way arrive at a more satisfactory comparison of the various cars.

A Tyre-Detaching Competition at the Olympia Show.—The enterprise of the "Continental" Tyre Company has evolved a new scheme of attraction which they will put into operation at the forthcoming show at Olympia.

At their stand will be a motor car artillery wheel fitted with a 1905 model Continental tyre, and those who wish may try their hand at detaching this and refitting a new inner tube. The competitor who succeeds in doing this in the least time and to the satisfaction of the judges will receive the substantial reward of £10, while there are numerous other money prizes for those next in order of merit.

The rules of entry are very simple, and entail no expense on the competitor. Names must be sent in by February 6th; anyone owning a driver's licence, or able to produce a certificate of employment in any automobile factory, garage, or agency, is eligible for competition. The necessary tools will be provided on the stand, and these only may be employed by the competitors. No competitor may receive help, and the exchanging of the tubes must be done in the ordinary way, a few brief instructions being included in the circular of particulars, which may be had on application to the company.

The Continental Company have hit on an idea—already carried out by them on the Continent—which, besides providing an interesting attraction, should afford useful data as to the most usual cause of trouble in the refitting of tubes, and it is to be hoped that the Company will be able to give some valuable advice on this subject based on their observations during the trial.

A REMINDER was received last week of the Blackpool Motor Meeting held last autumn, when a presentation took place to Mr. G. Hubert Woods, A.M.I.C.E., of Blackburn, who officiated during the meeting as honorary secretary, and was mainly instrumental in arranging and carrying through the whole of the programme. The presentation, which was made by the Mayor, Mr. Alderman J. Brodie, J.P., took the form of a gold non-magnetic chronograph. The back of the case was engraved with the Blackpool coat-of-arms, and on the inside of the lid was the inscription: "County Borough of Blackpool Motor Car Speed Trials, October, 1904. Presented to Mr. G. Hubert Woods as a memento, and in slight recognition of valuable services rendered by him as Honorary Secretary to this successful motor meet." A large number of those connected officially with the Blackpool Corporation gathered in the Mayor's parlour for the purpose of the presentation, and in a few happy words Mr. Woods acknowledged the gift, and hoped, he said, to be connected with the next meeting in that city.

PETROL MOTOR CARS.*

By FRANK LITTLE, A.M.I.E.E.

THE nature of Mr. Little's paper is such as to include in broad outline the general features of a motor car and the main functions of the principal parts. Commencing with the engine, the author dealt lucidly with the action of the Otto cycle, and explained in detail the sequence of the various strokes by the aid of diagrams.

Passing on to constructive details, the various essential parts were dealt with under their respective headings, while numerous diagrams and photographs were used to elucidate the explanations. Most of the cars and parts referred to have already been described in THE AUTOMOTOR JOURNAL, so that we refrain from reprinting the whole of Mr. Little's interesting paper.

Choice of Cylinders.—Single cylinders are only recommended in small cars requiring up to 8-h.p. Above this power two or four cylinders are the commonest numbers, but engines are being built with three, six, and eight cylinders. Although in each cylinder the same process is going on, the increase in the number of cylinders involves considerable complications with the inlet and outlet valves and the mechanism for working them. Leading makers are now building up their engines with single-cast cylinders, and we shall probably see twin-cylinder castings disappear. The single cylinder appears to be so much more easily cast and machined, whilst its cooling, mounting, and dismounting are so much more effectively and cheaply done.

Carburettors.—A carburettor is employed to vaporize the petroleum spirit and mix it with air in such proportions as to constitute an explosive gas.

A mixture of 8,380 volumes of air to 1 volume of liquid petrol gives good results with little odour, and no fouling of the valves and parts.

For reference the following tabulation will be useful:—

Specific gravity of petrol	... 0.660 to 0.710 (at 69° Fahr.).
Boiling point	... 149° to 194° Fahr.
Chief constituent	... Hexane (C ₆ H ₁₄).
Volume of air for perfect combustion per kilo.	... 11.8 cubic metres.
Proportion of liquid to air for perfect combustion	... 12.4 to 100,000.
Proportion of vapour to air by volumes	... 2.15 per cent. vapour.

The two principal types of carburettor are named "surface" and "spray."

Surface Carburettor.—In this type of carburettor the engine suction draws the air over the surface of the petrol. The air becomes then charged heavily with petrol vapour, and in its passage to the inlet-valve is again diluted with more air in such proportions to give the best explosive result.

Spray Carburettor.—The spray carburettor has many different patterns, although the main principles are the same. The principle is to evenly divide the spirit so that it presents a maximum amount of surface to the incoming air, and is capable of being held in suspension in the air-current for the short time necessary for the transformation from the liquid to the gaseous state. There are various ways of accomplishing this purpose, but in most cases the effect is that a continual flow of air issues from a conical nozzle, which creates a vacuum in the central portion of the flow, thus causing the suction of the motor to draw the air through a contracted tapered passage, over a nipple having a very fine hole, or series of holes. The vacuum that is produced by the rush of air causes the petrol to issue in the form of a finely-divided spray, which, in meeting the current of induced air, is immediately vaporized and carried over to the motor cylinder, after being mixed with a quantity of additional air admitted to the aperture in the up-take of the carburettor.

The chief advantage of the spray carburettors is that they can be adjusted to use petrol or alcohol of any density, or even paraffin, after preliminary warming by a few minutes on petrol. The worst fault with this carburettor, unless provided with an auxiliary air-inlet, is that it will not generate the mixture in constant proportions at varying speeds, giving too rich a mixture at high speed, which, if corrected, renders the mixture weak at low speeds. The faster the air passes the jet, the greater the suction effect will be, so that when the motor increases its speed, the proportions of the mixture are apt to be altered. The speed of the air should be from 80 to 100 feet per second.

Cooling.—The circulating system should be designed to prevent air-locks, and an air-cock should be provided at the highest point of the system and a drain-cock at the lowest, so that for cleansing purposes and in frosty weather the water can be easily run off. The car should have not less than half a gallon of water per indicated

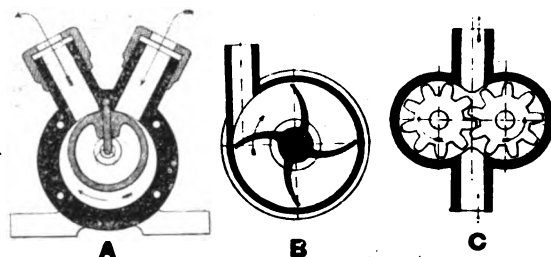


FIG. 1.—Three usual types of Circulating Pump.—A, Eccentric; B, Centrifugal; C, Gear-Wheel.

horse-power. The temperature of the water leaving the cylinder jacket should be about 170° Fahr. Fig. 1 shows three usual types of circulating pump, (A) eccentric; (B) centrifugal; (C) gear-wheel.

Lubrication.—Lubrication comes under the three main headings of gravity feed, splash lubrication, and forced feed. The first and second systems, being the most restricted, in a sense, may be discussed first.

Gravity Feed Lubrication.—Pure gravity feed consists of a sight feed-cup of toughened glass with a metal cap, in which is a little shuttered air-hole, the closing of which regulates the supply through the tube beneath the cup to the part to be lubricated. This is the simplest form of gravity feed.

Splash Lubrication.—Splash lubrication is very universal for all bearings inside the motor, such as those for the crank-shaft, cam-shaft, and cams, enclosed gears, and the lower ends of the connecting-rods. It simply consists of a bath of oil inside the crank-chamber, the cranks dashing the oil over all the working parts. It is a dirty but thoroughly effective system, and is also used for the differential gear and the change-speed gearing.

Forced Feed Lubrication.—In the forced feed lubrication both mechanical and physical systems are employed. The former system is employed by some of the leading makers; channels are bored centrally through the crank-shaft, cranks, crank-pins, connecting-rods, and gudgeon pins (in the piston). The oil is thus driven by centrifugal force through all these to their bearings. In the latter system means are employed to utilise the pressure from the exhaust or water system; under this action special means are employed to force the oil along the branch pipes leading from the lubricator. In pressure feed the reservoir may be placed in any position, and below the level of the parts to be oiled. In this case either the oil is forced through the pipes by an automatic force-feed pump worked by the engine, or part of the exhaust gas is diverted through a non-return valve into a reservoir, maintaining a pressure on the oil of 2 to 4 lbs. as may be required. The pressure of the circulating water is sometimes used for the same purpose.

Silencers.—All internal combustion motors are fitted with a device to silence or muffle the noise made by the exhaust gases as they pass out at the end of the explosive stroke. It is not essential to the efficient working of the motor, and if not properly designed may set up a back pressure. A perfect silencer should muffle all exhaust noises without setting up any back pressure whatever.

This is effected, first, by gradual expansion in a closed chamber divided up into a series of freely inter-connecting expansion chambers, and secondly, by turning the stream of gases at a right angle to its last direction, and splitting it up into smaller streams. Fig. 2 diagrammatically illustrates the action of the silencer; in the upper diagram the baffles have their orifices in line, while in the lower diagram the orifices are staggered.

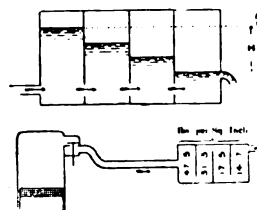


FIG. 2.—Diagram illustrating the decreasing pressure of the exhaust gases passing through a silencer. In the upper diagram, the ports in the division plate are in line, in the lower diagram they are staggered.

L.T. Ignition Device.—The ignition plug proper consists of the ignition port cover carrying one insulated contact which projects into the combustion chamber, and alongside this a rocking spindle, having at

its inner end an arm which bears upon one insulated contact pin, the contacts being provided with platinum tips to prevent corrosion. To the outer end of this spindle is keyed a cross-head or double-ended lever, to one end of which is attached a spring tending to rock the spindle so as to bring the arm into contact with the insulated pin; the other end of the cross-head receives a blow from the striking spindle which causes a sharp

* Excerpt of a paper read before the N.E.C. Inst. Engineers and Shipbuilders at Newcastle-on-Tyne, January 20th, 1905.

rupture of the circuit. This striking spindle is lifted by a simple trip cam on the half-time shaft, and it is made as light as possible, so that the lapse of time between the moment that it is freed by the cam and the rupture of the electric circuit, and consequent ignition of the charge, is reduced to a minimum. This has been experimentally determined and found to be less than $\frac{1}{100}$ of a second.

By setting the trip gear to fall while the crank has still 18 degrees to rotate before reaching the upper dead centre, it was found that the maximum torque and brake horse-power of the engine could be got at a speed of from 550 to 850 r.p.m.; and it was also found that with the ignition fixed at this point there was no danger of a back kick in starting, and the engine ran quite smoothly and steadily as low as 150 to 200 r.p.m. By setting the trip gear 27 degrees before the dead centre, about 5 per cent. more power could be got at a speed of 950 r.p.m., but the power at 700 was 3 per cent. less than with the previous setting, and with the ignition set thus there was a slight risk of a back kick at starting. Practically a moderate speed motor does all its work within a range of from 500 to 850 r.p.m., so it is evidently quite unnecessary to provide a variable ignition. Indeed it seems a distinct advantage to have a fixed ignition, as the above results indicate, for it is very probable that the driver would rather lose than gain efficiency on the whole by having a variable ignition, which might effect a slight saving at the top speed of the engine, but this would be more than compensated for by the inefficient setting at lower speed. It is obviously desirable to simplify, as far as possible, the mechanism and driving of cars, and by fixing the ignition one lever is thus eliminated.

In ordinary high tension ignition there is, of course, considerable time lag between the making of the contact in the primary circuit and the rise of the magnetic flux in the coil, sufficient to draw the trembler and break the circuit, whereupon the ignition spark occurs, and it is principally this time lag that makes it necessary to provide a means of varying the time at which the primary circuit is closed, or in other words, providing a means of compensating for this time lag. As everyone is aware, a careless driver can set up enormous strains on the crank-shafts, and other parts of the engine, by running an engine with the ignition set too early, as many broken crank-shafts have testified.

Clutch.—Passing to the clutch, which is usually interposed between the engine shaft and the transmission system, the friction type of clutch is the one most extensively used in motor car work.

The conical patterns (Fig. 3, A and B) are very general. The flywheel of the motor is usually coned to receive the male portion of the clutch attached to the shaft to be driven, and sliding on it.

The face of the male portion is usually covered with leather.

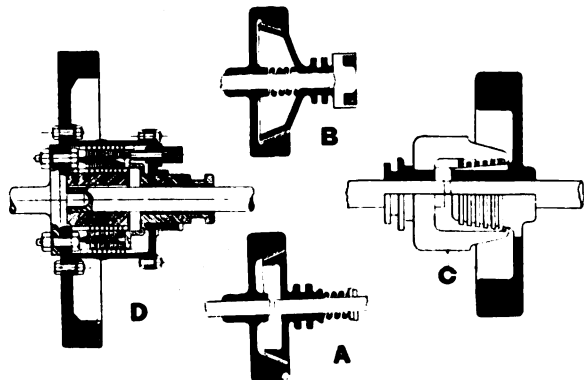


FIG. 3.—Some types of Main Clutches.—A, External Cone; B, Internal Cone; C, Coil or Scroll Clutch; D, Hele-Shaw Multiple Disc Clutch.

There is a groove in which a fork, operated by a foot pedal, withdraws the clutch when the driver so desires. A powerful spring is employed to hold up the two engaging parts of the clutch.

Mercedes Clutch.—In the Mercedes car a coil clutch is used (Fig. 3, C). In this clutch the gripping action is obtained from the automatic tightening action of a spring steel coil upon either a parallel or a conical steel drum. It is important with all clutches that there should be no end thrust on the engine or gear-box bearings. A satisfactory clutch is one of the most difficult things to secure. The ordinary type of cone clutch, which is covered with leather, can rarely be maintained in a normal condition for the following reasons:—A great command over the car, especially in driving through traffic, is secured by allowing the clutch to slip.

When the slipping has been going on for some time the clutch will not grip at all, or it grips violently or harshly. The result is that driving is not only most unpleasant, but is very injurious to the car itself. (To be continued.)

NOTES ON THE PARIS SALON.

ON Thursday, January 19th, Mr. E. H. Cozens-Hardy read a very interesting paper on the above subject before the members of the A.C.G.B.I. It is, as our readers are aware, a subject which we have already treated at great length in our exhaustive series of articles on this important show. Mr. Cozens-Hardy, in his paper, drew attention to the leading tendencies of design, and commented on their effect upon the motor car as a whole, the Statistical Table, reproduced herewith, being embodied in the paper to show more concisely the points of his remarks.

Paris Salon, 1904. Statistical Table.*

TOTAL NUMBER OF CARS EXHIBITED 265.

Engines.—Power.—Up to 8-h.p. 7 per cent.; 8–20-h.p. 37 per cent.; over 20-h.p. 56 per cent.

Number of cylinders.—One cylinder 6 per cent. (1903, 15 per cent.; 1902, 12 per cent.). Two cylinders 15 per cent. (1903, 26 per cent.; 1902, 38 per cent.).

Inlet valves.—Automatic 3 per cent. (1903, 23 per cent.; 1902, 55 per cent.). Mechanical (in head, 7 per cent.; same side as ex. valve 24 per cent.; opposite to ditto 66 per cent.); total 97 per cent. (1903, 67 per cent.; 1902, 45 per cent.).

Ignition.—Battery or accumulators 19 per cent. (1903, 72 per cent.; 1902, 74 per cent.). Magneto low-tension 26 per cent. (1903, 22 per cent.; 1902, 22 per cent.). Magneto high-tension 55 per cent. (1903, 6 per cent.; 1902, 4 per cent.).

Motor control.—On admission 96 per cent. On exhaust 4 per cent.

Radiators.—Cellular 53 per cent. Gilled tube 47 per cent.

Water circulation.—Centrifugal pump (friction-drive 6 per cent., gear-drive 64 per cent.), 70 per cent. Gear pump 16 per cent. Thermo-syphon 14 per cent.

Clutches.—Conical leather lined 77 per cent. (1903, 90 per cent.; 1902, 87 per cent.). Metal to metal 20 per cent. Miscellaneous 3 per cent. (1903, 10 per cent.; 1902, 13 per cent.).

Change-gear.—On ball-bearings 62 per cent. On plain bearings 38 per cent.

Transmission.—Chains 49 per cent. (1903, 53 per cent.; 1902, 62 per cent.). Cardan 51 per cent. (1903, 47 per cent.; 1902, 35 per cent.). Belt (1902, 3 per cent.).

Brakes on transmission mechanism.—Internal total 79 per cent. External total 21 per cent. On change-speed-gear 44 per cent. On differential shaft 48 per cent. On back axle 7 per cent. On clutch 1 per cent.

Brakes on wheels.—Internal (not enclosed 24 per cent.; enclosed 58 per cent.) 82 per cent. External 18 per cent.

Compensated brakes.—Ropes 38 per cent. Swing bar 15 per cent. Not compensated 47 per cent.

Rubbing surface of brakes.—(1) *Wheel brakes.* Steel on steel 34 per cent., cast-iron on steel 24 per cent., bronze on steel 29 per cent., camel hair on steel, 10 per cent., brass on copper 3 per cent. (2) *Transmission brakes.* Steel on steel 26 per cent., cast-iron on steel 48 per cent., bronze on steel 25 per cent., camel hair on steel 1 per cent. (3) *All brakes.* Steel on steel 30 per cent. (1903, 33 per cent.), cast-iron on steel 36 per cent. (1903, 26 per cent.), bronze on steel 27 per cent. (1903, 17 per cent.), camel hair on steel 5 per cent. (1903, 14 per cent.), brass on copper 2 per cent. (1903, 10 per cent.).

Frames.—Pressed steel 79 per cent. (1903, 46 per cent.). Armoured wood 16 per cent. (1903, 32 per cent.). Tubular, &c., 5 per cent. (1903, 22 per cent.).

Rear brakes.—Outside frames 70 per cent. Under frames 30 per cent.

We are gratified to find that Mr. Cozens-Hardy's views on most of the matters coincide with our own, and for that reason it is unnecessary to reprint his most interesting paper in full. We must, nevertheless, give our readers the benefit of his humorous—but very true—introduction and conclusion, in which he throws into relief two very prominent and very amusing aspects of automobile shows—particularly the Paris Salon.

“At this year's Paris Salon there were present at many of the stands the technical men who knew their machines, and appreciated their own good points, and why other people's good points, genuine or alleged, had been knowingly left out for economy, or abandoned after trial; but still, as at all exhibitions of the kind, one was also confronted with the dogmatic showman. This poor fellow is truly engaged on a wearisome, and, perhaps, even unsympathetic duty, but it is difficult to resist the desire to bait him when he reaches the summit of autocratic assertiveness and ignorance. There is the man whose magneto ignition takes $\frac{1}{10}$ th of a h.p., and who proves it by saying the output is 36 watts. There is the man whose big-end

* Percentages are for 1904 only, unless otherwise stated.

bearings never can want attending to, whose gear wheels cannot wear, whose engine cannot get dirty, whose rubbing parts cannot want replacement, whose low-tension igniter tappets cannot wear out of tune in four cylinders, whose exposed lubricators cannot freeze, whose carburettor cannot give anything but the most perfect mixture at all air temperatures, all speeds, all conditions of throttle opening, and all qualities of petrol, and whose car only fails to win the Gordon-Bennett because it is not entered.

"From the spectator's point of view there was a noticeable advantage in the last few days of the Salon over the first week, because the assistants had ceased from troubling, and had abandoned the spider and fly attitude which at first made it difficult to examine any one part of an exhibit because the attendant was so mortally afraid some other part would be missed. . . ."

"Perhaps the occasion of the Paris Salon is a legitimate one for

discussing the use of French terms. Personally I see nothing wrong about the word *chauffeur* except printing it in italics and attempting to pronounce it as if it were French. It records automobile evolution from the days of steam; it is not a term of servitude, like 'coachman,' or 'motor-man,' or 'driver.' It is a useful word, conveying as definite a meaning as the word 'chassis,' or 'police trap,' and does not imply too much, like 'automobilist,' or specialise too much, like 'steersman.' Motoring has developed entirely since the days of newspapers and telegraphs, hence its new terms must become international, and the balance of indebtedness is well on the side of the Continent, where the talk of 'sportsman,' 'motogirl,' 'stop,' 'alright,' 'stand,' 'respectable,' 'speed,' 'gentleman,' 'square,' 'shocking,' 'barmaid,' 'record,' 'yes,' 'endurance,' 'touring,' 'club,' have been found by the writer on one page of a French automobile journal this week."

THE FIRST YEAR'S WORKING OF THE MOTOR CAR ACT.*—Conclusion.

By A. Moresby White, Barrister-at-Law.

THE police trap question calls for a short notice. As a rule the evidence of a policeman when timing cars is wholly unreliable, not merely as to the correct taking of the time, but as to the surrounding circumstances of the case. A policeman will give evidence in Court as to persons being on the highway and having been seriously endangered, although he never called the attention of the motorist to their presence at the time. Frequently his own note-book does not support his assertions. Indeed, in many cases in my own experience the police have imagined persons were on the highway, and in imminent danger. Unfortunately the magistrates are somewhat prone to act upon this sort of evidence, however strongly it may be denied by the motorist and rebutted by other facts. An account of a conversation which has taken place between the police and a stopped motorist, when retailed in Court, is always most edifying. Rarely do any two accounts agree; when the policeman contradicts the version given by the driver it is curious that his note-book seldom contains anything to corroborate his statement. In some cases the note-book contains an entry obviously made at a subsequent date for the purpose of dressing up the case. When stopped by a policeman the motorist should inquire if there is a watch, and demand to see it, taking a careful note of the position of the hands and of the watch itself. Make a written note as soon as possible of the conversation, and particularly as to the presence of traffic on the highway at the time. The wheel marks of a car left on the road surface are frequently of great value in proving where the car was. The man who, after being stopped, hurries on without taking some precautions, is foolishly throwing away his best chance of defeating the police. To give warning to anyone of a trap is no offence; it is warning a person not to break the law.

I have said that there must be strict proof of danger to the public. Mere opinion is not evidence, and the opinion of a policeman ought not to be admitted as evidence. Yet it is common to find a policeman swearing thus: "The car covered the measured distance, 220 yards, in 18 seconds, which works out at 25 miles an hour, in my opinion a most dangerous speed to the public." Again, he will give evidence: "The car passed me like a flash of lightning, being driven in a manner, in my opinion, dangerous to the public." This kind of thing must be severely checked. His opinion is no evidence at all; the main point to be decided in the case is whether, in the opinion of the Bench, there is clear evidence of public danger. A policeman may only testify to facts; he has no right to offer his opinion, nor have the Bench any right to ask him for it.

Magistrates are too ready to make use of their local knowledge; they are acquainted with the locality and the general traffic; they assume that the circumstances which are familiar to them have been present in every case. They ought not to assume any facts; the nature of the traffic should be proved by testimony. Each case stands on its own particular facts. Generalisations from previous cases are easy to apply to a fresh case, but frequently work grave injustice against the motorist.

In considering the rule of the road, and in all matters appertaining to highways, the motor car is entitled to be dealt with as a carriage. If an accident happens to a carriage, we do not immediately assume that the carriage has been driven furiously; it may be that the affair was a pure accident. Again, the driver of a carriage may injure someone, thereby rendering himself liable to an action for damages, without the slightest suggestion that he has committed any serious offence, and without being guilty of any criminal misconduct. To establish criminal responsibility against the driver of a carriage requires very clear and cogent proof. Exactly the same rules apply to motor cars, but bitter experience teaches us that if a motor car is present when an accident happens, the mere fact of its presence is promptly construed as positive evidence completely

negating any mere accident. The motorist is at once fixed with civil liability and with serious criminal responsibility. It seems incredible, but I have heard magistrates say: "There has been an accident, therefore you ought to be convicted."

The offence of driving in a manner dangerous to the public is further elucidated by reference to Article 4 of the Regulations of the Local Government Board, which contains several directions to be observed by all drivers.

In all cases when summoned into Court, the motorist should ask: "Have there been any complaints by the public of my driving? Do the police produce any witnesses, drivers, cyclists, or other members of the public, who say that I have endangered them?" The travelling public must put up with mere inconvenience on the road; something much more serious ought to be proved to justify a criminal charge and to warrant a conviction.

It is worth while observing that the offence of furious driving on the highway is dealt with by other statutes. In the Highway Act of 1835 there are ample provisions for restricting the speed of any carriage, which includes any motor car. Again, in the Towns Police Clauses Act, 1847, there are further restrictions on driving which are applicable in urban districts. Moreover, under the Metropolitan Police Acts power is given to punish the furious driving of any vehicle within the metropolitan area, which extends, roughly speaking, 20 miles round Charing Cross. But in the zealous working of the new Act these valuable provisions have been utterly ignored; it is always "a case under the Act!"

The power of a policeman to arrest without warrant is strictly limited to cases of felony, or of breach of the peace, or where authorised by special statute, as, for instance, by Sub-section 2 of Section 1. It may be observed that the power of arrest does not justify an assault, it only avails against the actual driver. If a driver has not got his licence with him then there can be no refusal to produce it, but the driver may be proceeded against under Section 3 for not producing his licence.

There is a new liability imposed by the Act on all owners of motor cars entirely without precedent in the criminal law. In certain circumstances he is bound to give information which may lead to his own conviction. The principle of the law has always been that no person is bound to criminate himself, and any exception to this rule ought to be most strictly construed. The plain reading of the Act is that if a car has committed an offence under Section 1, then the owner of such car must give any information, which it is within his power to give, which may lead to the identification and apprehension of the driver. It has been assumed that he is bound to give this information to the police, but the Act does not say so, nor does it say who has a right to ask for such information. An attempt is being made to extend this liability of the owner to the case of a car exceeding the legal limit of 20 miles, and the point will shortly be brought before the Court for decision. The owner's liability is, on the face of the section, restricted to those cases where the driver has refused to give his name or address, or has given a false name or address, and there is every reason for contending that it is only in such cases, where there has been a deliberate attempt by the guilty person to deceive the police, this serious liability should be thrown upon the owner of the car. On the other hand, it is said if a driver travels at excessive speed for many miles, refusing to stop, there is no method of catching him, it being almost always impossible to identify him. In such a case, it is argued, the car has offended under Section 1, and although the driver has not refused his name or address, yet the owner must give information to the police, otherwise the more guilty the man the more chance he would have to escape. But the truth is, this case is not provided for by the Act; to cover such flagrant cases the section has been extended by the Courts in a most unwarrantable manner.

* A Paper read at the Automobile Club on January 12th.

No test of skill in driving is required by the Act. Before a licence is issued to a driver there seems to be no reason why some examination should not be imposed upon the applicant.

The endorsement of the licence is the principal penalty provided by the statute, and it *must* follow on any conviction in connection with the driving of a motor car. It is not limited to convictions under the 1903 Act; it is wholly immaterial under what Act or regulation the driver is convicted, his licence must be endorsed. To this sweeping rule there is an exception—the first offence and the second offence of exceeding the speed limit of 20 miles per hour. Any "offence under the Act" entails endorsement of the licence, and it is open to argument that the mere non-production of his licence by the driver owing to his inadvertently having left it behind him must entail the serious penalty of endorsement of the licence.

For the purpose of endorsement the licence must be produced within a reasonable time, but the motorist is not bound to produce it in Court immediately on his conviction. Indeed, he is not bound to have it with him in Court. The only time the licence *must* be produced is when the holder is actually driving a motor car. It is a common practice in motor car cases for the police to get the licence from the accused directly his case is called, and hand it up to the Bench for their inspection; should there be any existing endorsement upon it, the chances of that motorist escaping conviction are very small. This practice is quite illegal, and every motorist should resist any application of this sort made to him. He is under no obligation to produce his licence until a reasonable time after his conviction, which would probably be seven days, the period allowed for giving notice of appeal.

The regulations as to marks, particularly manufacturers' marks, stand in need of revision. The general identification mark ought to be extended in its use; the present restrictions upon it are so narrowly construed by the magistrates that the dealer finds himself severely hampered in his business. Indeed, unless he is very careful he is exposed to a charge of fraudulently using identification marks under Section 5 of the Act, a charge only to be brought on the strongest evidence of dishonesty or forgery. Nevertheless, the Inland Revenue authorities have recklessly brought such charges against dealers, putting them to great inconvenience and expense in defending themselves. The meaning of "trial after completion" is in each case a question of fact, whether completion has happened; there may be several such trials. "Trial by an intending purchaser" does not justify the hiring or loan of a car with a general identification mark.

The Local Government Board have power to restrict in any way or prohibit entirely the driving of cars on any road where motor traffic would be especially dangerous. This has only once been exercised in England, at Beverley, while no instance exists in England of an area with a 10-mile limit, although numerous applications have been made to put this limit in force. It is a pity some of these anxious Local Authorities have not utilised their other powers under the Act to erect sign-posts at dangerous places on the highway, which would be of real value to *all* travellers. This valuable power is wholly neglected.

Exceeding the legal limit of 20 miles per hour is an offence not so frequently charged as an offence under Sec. 1. There must be in evidence something more than the opinion of one witness, not merely a watch held by him, but independent corroborative testi-

mony. The driver must be warned of the intended prosecution at the time, or notice of the intended prosecution must be sent to him or the owner of the car; in either case it gives him a chance of getting witnesses on his behalf. If a policeman says, "I shall report you," it is hardly telling a man that a prosecution is intended; in such a case, if a written notice has not been given, it seems that the driver cannot be convicted under Sec. 9.

All motor car offences may be dealt with by the summary jurisdiction of the magistrates, and from their decision there is no appeal in the facts unless a fine of over 20s. is inflicted. Then the appeal is to Quarter Sessions, where the prejudice against motorists is frequently a serious matter. If an appeal is intended, the proper notice must be given within seven days of the conviction. This is a most important point; the person aggrieved must make his decision quickly, and serve his notice within seven days. Other remedies only apply to matters of law. Where a conviction is bad on the face of it, and in some other instances, it may be quashed by a writ of *certiorari* from the High Court, a procedure which has already been used successfully. It is a valuable protection to motorists, though little known at present.

The magistrates may state a case, on a point of law, for the opinion of the High Court, but this remedy is of little use, as it is very easy for the magistrates to so word the case that the appellant has no chance of success. A fourth course open is to apply to the High Court for a writ of mandamus, ordering the magistrates to hear and determine according to law, which is of no practical value.

The Heavy Motor Car Order was issued after this paper had been written, but a word on one aspect of it may be useful. Extraordinary traffic is not prohibited by any statute; the person responsible for it must pay for any damage thereby occasioned. Excessive weight is one thing, and may damage a road; traffic is another thing, and includes the continuous or repeated use of a road by various vehicles belonging to one owner, quite apart from the load carried. The thing to regard is the ordinary traffic of the particular road in question. Claims under this head may be brought in the County Court if not exceeding £250.

Has the public mind been satisfied by the 1903 Act? Probably not. The nuisances of dust, of noise, of smell, all survive. For each of these the motorist is liable at common law if it is clearly brought home to him individually. The main objection in the public mind to the motorist is speed, not the fallacious test of speed in miles per hour, but improper speed at any special place. The highway is still regarded as the legitimate playground of children, dogs, and fowls. Any speed which threatens this ancient vested interest is obviously to the public mind dangerous. Therefore it is that Section 1 of the Act has been relentlessly enforced, backed up by more false swearing than any other Act ever evoked, until the experienced motorist has painfully realised that his statements are scarcely ever believed in a Court of Summary Jurisdiction.

The main object of the Act has been achieved; cars can be easily identified, and, in most cases, the drivers also, this without serious friction. So far the public safety is secured, but the apprehension of danger remains. Deep rooted in the public mind is this fear of the speedy vehicle on the public road. Until by gradual education this is removed the motorist must expect to suffer the usual fate of a minority.

MOTOR CYCLING.

Four-Cylinder Motor Bicycles.—Our readers are already aware that the 4-cylinder motor bicycle is, if not commonly observed in the streets, at least a marketable commodity and that it was to be seen both at the last Stanley Show and at the same show the previous year. Especial interest, therefore, attaches to the remarks of Mr. C. Binks—whose machine we described and illustrated in connection with the last-mentioned Exhibition—as embodied in his paper, read before the A.C.E.I. at Birmingham, on Friday, the 20th inst., on account of the essentially commercial aspect from which he looked upon the matter.

Mr. Binks considered that there was no question as to the increased smoothness of running of a 4-cylinder motor-bicycle, but it was obtained at a high price. Several difficulties present themselves to the designer of this type of machine: in the first place there is lack of space; then it is not easy to keep the weight down, but still more difficult is it to make such a bicycle thoroughly durable. Of course, the advantages of smooth running, absence of vibration, and ease of control are considered—and they are found to be very prominent in the 4-cylinder motor cycle—but Mr. Binks contended that the cost of obtaining those advantages is prohibitive from the point of view of commercial success, and that, in order to retain them, to realise that constant attention and most skilful driving is needed.

The great exposure of the engine, and the minuteness and multiplicity of parts, render the liability to derangement very great. Mr. Binks said he had found it useless to build an engine having a bore of less than 2 in.; in the model exhibited, the bore and stroke were 2 in. and 2½ in. respectively. He considered that there was more scope for such an engine when applied to a fore-carriage, where it could be better protected from the dirt, but in that case it would be imperative to have a two-speed-gear. On an ordinary bicycle, on the other hand, it would be possible to get anything from 4 m.p.h. to 50 m.p.h. with a direct drive only.

Satisfactory workmanship, said Mr. Binks, could hardly be shown on such a machine unless the selling price were about £70, and with the advent of the really cheap light car, the author considered that the 4-cylinder motor bike would altogether lose its *raison d'être* as a commercial product.

International Motor Cycle Cup.—Conforming to the desire of some of the foreign motor cycle clubs, it has been decided by the Moto Cycle Club of France to alter the date of this important fixture from May 14th until the end of June. February 1st is the closing date for the acceptance of challenges from the various recognised clubs.



OLYMPIA AUTOMOBILE EXHIBITION.—A view of the main hall cleared for action. The figures in the centre convey an idea of the vastness of this magnificent structure which, within the next few weeks, is likely to be uncomfortably crowded by the number of visitors who will probably visit the very important display of automobiles to be held from February 10th to 18th.

Olympia Exhibition.—Every courtesy is being extended by the Society of Motor Manufacturers and Traders, Limited, to various bodies in connection with the automobile industry. In addition to the special provision made for members of the Automobile Club, where the Princes Room has been specially set apart for them, they have also notified the A.C. de France that all members of that club will be admitted to the Exhibition at any time simply upon the presentation of their membership card for 1905.

WE learn from Messrs. Merryweather that the L.C.C. have just placed an order for one of their well-known "Fire King" steam fire engines. This type of engine was very fully described in our issue of June 7th, 1902. The machine which is to be built for the L.C.C. will be oil fired, and will have a capacity for pumping 500 gals. per minute.

THE service of motor cars between Windermere and Keswick are this season to be considerably extended, the experiments entered upon during the last year having proved thoroughly successful. Not only will this exquisite road be further opened up to tourists, but the service will probably be extended in several other directions in the Lake District.

A BICYCLE belonging to one John Anderson, of Stockton, was damaged in collision with Lord Alington's motor car. The cyclist was promptly, with commendable generosity, offered ten guineas for the purpose of procuring a new machine, but no doubt Anderson, taking into consideration the prejudice generally holding good against automobilists, preferred to have the damages assessed in the Stockton County Court, where he has had the satisfaction of being awarded £4.

HENRI FOURNIER was last week arrested in Central Park, in New York, for alleged excessive speed driving on his car, and was fined £20.

WE have received No. 7 of the *White Bulletin*, which illustrates in an impressive manner the rapid progress which this excellent type of steam vehicle is making both in the United States and in Europe. The *Bulletin* is as usual enlivened with a number of attractive illustrations, one of which shows a White car fording the celebrated Bull Run in Virginia. From the *Bulletin* it would appear that the White cars are attracting increased attention from the United States military authorities, and the cover of the periodical shows a White car taking part in the recent Army Manœuvres.



OLYMPIA AUTOMOBILE EXHIBITION.—A view of the Hall from a corner of the Gallery.



The new model of the two-seated Oldsmobile car, fitted with wheel steering and a French type of body.

SEVERAL attempts have been made in the design of both small and large cars to obtain graceful lines, particularly in the front, in order to get away from the appearance of horse-drawn vehicles. The placing of the engine in front has brought about the general acceptance of the bonnet, with which the majority of cars are fitted, and although in the early days these were voted hideous in the extreme, custom has rendered them more acceptable, and a car, with certain exceptions, to be in the fashion, must embrace in its design this now generally accepted part of an automobile. In order to fall in with the views of many of their clients, the makers of the two-seated Oldsmobile car have found it advisable to place a car designed on these lines upon the market. In the photograph on this page is seen the first of these, which Mr. W. M. Letts brought over with him from America, so that the requirements of those people who prefer one of these little runabouts, with wheel steering and a French type of body, can now have their wishes gratified.

The two-seated Oldsmobile fitted with tiller steering and curved dash is, of course, still the standard model, it having become far too popular to give any reason for its suppression. The new model is, therefore, merely an additional type, included to meet the requirements of those who prefer wheel steering and French body, and are prepared to pay the slightly increased price required for these features.

CLUB DOINGS.

Herefordshire A.C.—The Annual General Meeting of the club was held at the Mitre Hotel, Hereford, on January 18th, when Mr. J. T. Hereford presided. The hon. secretary and treasurer, Mr. Wilfrid Groom, in submitting his report and statement of accounts, said he thought the club ought to congratulate itself on the fact that it had a balance at all in hand considering the large demands made upon its funds. He pointed out that they had relieved the A.C.G.B.I. of nearly £100 in expenses in connection with the recent Small Car trials. This was a large amount for a new and small club to find, when the half of their receipts were paid away in fees to the A.C.G.B.I. for affiliation. However, there was a balance in the bank of £2 9s., and he saw no reason why there should not be a handsome balance to their credit at the end of 1905, as they would not have the expenses of forming the club again, nor would they have to work fifteen months instead of twelve on one subscription. The following officers were elected:—Col. E. S. Lucas Scudamore, president; Col. Hopton, Rev. H. G. Morgan, Messrs. J. T. Hereford and H. Graystone, vice-presidents; Capt. Inglefield, Messrs. E. W. Chave, J. Fryer, J. H. Hall, E. C. Woollard, A. W. Marriott, Q. Miller, A. Townsend, J. C. Vaughan, J. Parker, and E. W. Langford, committee; and Mr. Wilfrid Groom, hon. secretary and treasurer. It was decided to approach the County Council over the universal lighting question, and the hon. secretary was requested to ascertain the views of other provincial clubs on the matter. A vote of thanks was passed to Mr. J. T. Hereford for his services during the past year as president, and to Mr. Groom as hon. sec.

Scottish Automobile Club (Western Section).—The date of Dr. Ormandy's lecture on motor fuels has been postponed from the 23rd instant until Monday next, the 30th instant.

Sheffield A.C.—In the committee's report for 1904, it is pointed out that the broad-minded spirit of the Sheffield Watch Committee combined with the consideration shown by the Chief Constable, the Act has, in the district, been an unbounded success.

The Rules governing the club trials are now under revision.



The Swift Motor Company, Limited, are placing on the market for 1905 a 12-15-h.p. 4-cylinder car. The above is the first of these new models which can now be seen at the Swift London Depot, where a variety of other charmingly designed carriage bodies can also be inspected.

THE old libel that women differ from men in not being clubbable beings, should be disposed of once for all by the perusal of the "English-woman's Year Book," edited by Emily Janes (A. and C. Black), for the number of institutions, clubs, and organisations specially confined to women which this useful publication comprises, is enormous. In regard to automobilism, the "English-woman's Year Book" has been brought well up to date, and in a chatty little article the subject is discussed in its relationship to women's life and work. Even the prospects of motoring as a profession for women are discussed; but though Miss Dorothy Levitt's exploits are referred to appreciatively, it is recognised that the chauffeuse—at any rate the professional chauffeuse—will not be a frequent phenomenon just yet. The article contains useful hints on suitable costume for motoring ladies, and gives particulars of the Ladies Automobile Club.

At the advent of each year we are reminded of that fact by the appearance of those ever useful publications, "Who's Who?" and the "Who's Who? Year Book" (published by A. and C. Black, Soho Square). Both works for 1905 comprise the same features as usual, and have been brought carefully up-to-date with the customary degree of reliability. The "Year Book"

is a particularly handy work of reference for anyone who desires to find out the names of official personages, and those of the leading editors, their papers, &c.

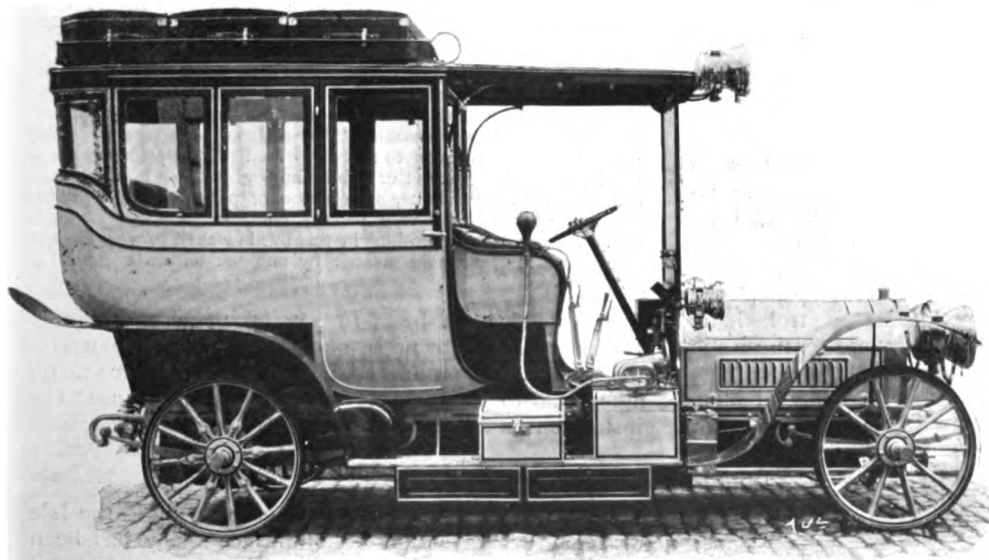
MOTOR boat competitions for racers and cruisers are to be run in March, during the Vienna Exhibition, on the Danube Canal, under the auspices of the Austrian A.C.

FROM Madrid comes the announcement that a new club has been founded, under the title of the Sociedad Automovil Club de Andalucia, for automobilists, with King Alphonso as honorary president and Señor P. Hernandez Carrera as vice-president.

PROFESSOR BOYS, Mr. Worby Beaumont, Mr. R. E. Phillips, and Major Lindsay Lloyd have been appointed by the Automobile Club an examining body, with Mr. Joy as secretary, to carry out the Automobile examination, in February, of the pupils in the Royal Marine Artillery class at Portsmouth.



A new model 15-h.p. Duryea side-entrance tonneau car, fitted with Cape Cart hood. Originality and grace in design are shown in this well proportioned carriage. The wheel base is 8 ft. 6 in., and roomy accommodation for three is afforded in the tonneau—for five in all. In its mechanical construction, all the latest Duryea features are embodied, while the weight complete is only just over 16 cwt.



One of the oldest automobile firms in Belgium is the Germain—also well known in this country through their energetic London representative, Capt. Masui—whose exhibit forms one of the most striking features of the Brussels Salon. A unique feature of the Company's stand is a car actually in motion. The contrast between the early days of automobilism and the present day is strongly demonstrated by the fact that, although the engine is running the whole time, very few of the visitors even notice that it is in motion, owing to the remarkable steadiness and quiet action of the mechanism. This 1905 model 24-h.p. Limousine, which is seen in our photograph, differs only in certain minor details from the 1904 model, the carriage itself being a perfect specimen of the coach-builder's art, the Germain factory always having made a point of producing a very high class type of touring car.

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INDEX

The above photograph shows a novel petrol-propelled tank wagon, which has recently been supplied by Messrs. John I. Thornycroft and Co., Limited, to the order of the Anglo-American Oil Company, who are able by this means to vastly increase the facilities for dealing with the delivery of their well-known oils.

SOME comment has been made upon the case in which a gentleman, who in a not unusual way paid a labouring man in his employment to drive a motor car, was successfully prosecuted by the Inland Revenue for keeping a male servant without a licence. We fear that everybody who has a male servant in his employment, whether he drives a car or not, is liable for this duty, and probably in the case in question the only difference made by the man driving a motor car was to attract attention. A gardener or labourer who gives his employer his whole time in a domestic capacity must certainly have a duty paid on him.

FROM the encomiums passed in the daily press on the *La Belle Chauffeuse* (at the New Gallery), the enthusiastic automobilist naturally expected to find an idealisation of the Spirit of Speed—the lady of the car, the counterpart of the spirit of the storm—flying along a beautiful materialisation of “a song of speed,” the abandon of feminine venturesomeness controlled by consummate nerve and skill. But the enthusiastic automobilist found nothing of the kind. He found a picture of a demure young lady—a harmony in blue, grey and brown, and pleasant and good-natured at most, and no car even in the background. The picture does show, however, that a lady's motoring costume can be tasteful, and that is a great deal.

MOST hills look blue in the distance, and the promises, more or less conditional, which have been made to London about those 1,500 omnibuses which we expect to see on our streets in the course of a year raise the envy of the Parisians, and they are exclaiming that it will be the Greek Kalends before Paris will see the like. Well, we don't know now whether Paris will not have more motor omnibuses running next year than we have; at any rate, it is far too soon for envy on the part of our friends and allies across the Channel.

THE great name of Mazzini has cropped up recently at Vienna in rather a comical connection. In Austria it is not only customary, as in Ireland, for everyone to take off his hat when a funeral is passing, but is even compulsory, and those who refuse to do so can be punished by the law. Mr. Mazzini, a motor cyclist, was recently haled before the magistrates for having refused, or, at any rate, omitted to accord this very natural and proper tribute of respect to a funeral which he was passing. His defence was peculiar. He said he was a very bad rider and that had he taken one hand off his handlebars to salute the funeral, he would in all probability have run into it as well, and that would have been worse than his seeming disrespect.

THE tripper or bean-feaster by wagonette or char-a-banc is never happy unless he has a horn (or similar instrument) on which he performs, usually at high pressure, to the great delight of his friends and fellow charabancists, but to the great disgust of the neighbourhoods through which he passes, particularly in the small hours of the morning. The London County Council has very sensibly determined to put a stop to the excessive use of the horn, at any rate at night-time, and for this purpose they have brought in the following bye-law:—

“If any person on any public coach or other public vehicle, hired or used for the conveyance of pleasure parties and the like, shall, between the hours of nine p.m. and six a.m., blow any horn, or use any other noisy instrument, or make or combine with any other person or persons to make any loud singing or outcry while passing through any street or public thoroughfare, to the annoyance or interruption of residents, such person or persons shall be liable on summary conviction to a penalty not exceeding £2 for each offence. Provided that nothing in this bye-law shall prevent the use of a horn in a reasonable manner by one person on a coach or similar vehicle.”

This should be a boon to a good many of the inhabitants of the Metropolis, and as the legitimate use of the horn is not prohibited it will, of course, make no difference to drivers of automobiles who use the instrument in a proper manner.

THE usual obstructionists have cropped up in the Isle of Wight, where a motor omnibus company has been organising a public service. The Rural District Council have informed the omnibus company that they will not hold themselves responsible for any accident which might occur owing to the narrowness of the roads or to overhanging trees and shrubs. We should think not, although how that will affect the situation is not apparent, as Rural District Councils have no responsibility in such matters whatever. Accidents that may happen from the shocking way they often maintain the roads are another matter.

COMMERCIAL POINTS.

The New "Gladiator" Home.—Rapid development of business in Great Britain has led to an important change in the distribution of the famous Gladiator cars, as from now the business will be conducted by the Gladiator Company at 8 and 9, Long Acre, W.C. The management will be in the hands of Mr. A. McCormack, long prominently connected with Messrs. Panhard and Levassor. 1905 models can be seen at the above address, and at the forthcoming exhibition at Olympia the Company will have a full range of their latest types on view. District agencies, we understand, can now be arranged for on making application to the Company.

Clipper Tyres.—In future the London business of the Clipper Tyre Company, Limited, will be conducted at 146, Clerkenwell Road, E.C., having been transferred there from No. 152.

THE sole English rights to the Delaunay-Belleville cars which were one of the interesting features of the recent Paris Salon, have been secured by the Burlington Carriage Company, Limited, of 215-217, Oxford Street. The identical 40-h.p. chassis which was on show at the Paris Salon will, we are informed, be on exhibition at the forthcoming Olympia Show.

ACCORDING to the *Bulletin* of the French Chamber of Commerce at Montreal, the automobile trade in Canada is steadily expanding. Several garages have been established at Montreal, in which city there are said to be nearly 200 automobiles, most of which are of American manufacture; a few, however, come from France.

As the Canadian roads are not very good, solid and powerful cars are the ones most in demand. The American car sells well at present on account of its cheapness; but, in the opinion of the *Bulletin*, a well constructed, fast running car, with perfect steering apparatus, would find purchasers, even at a high figure, as amateurs of motoring are beginning to grasp the fact that, owing to the necessity for frequent repairs, the cheapest machines prove dear in the long run.

It may be of interest to British manufacturers to note a suggestion of the *Bulletin* to the effect that several French firms should combine to establish a dépôt in Canada, to serve as a permanent exhibition of the advantages of French automobiles, with competent mechanics attached to execute repairs. At the present time, difficulties are often raised at repairing shops when cars, other than American, are sent to be dealt with; complaints are made as to the lack of the necessary parts, the intricacy of the machinery, and so forth, which naturally tend to discourage the purchase of such cars. —*Board of Trade Journal.*

FROM the Lancashire Steam Motor Company, Limited, of Leyland, we have received a little pocket diary and calendar for the year 1905, which contains a useful fund of information for daily use in connection with post office matters, both in this country and abroad, lighting up times, poisons and antidotes, first aid in accidents, and a number of shrewd suggestions for noting everyday points, under the heading of "How easy it is to forget—"

THE Ariel Motor Company has, from the commencement, been a successful undertaking. It has paid from the first, earning for its shareholders in the 1903-04 season a five per cent. dividend. The Ariel will be much in evidence at the forthcoming Olympia Exhibition, when visitors will have an opportunity of forming their opinions of the latest of these British-built cars.

WE referred last week to the present position of the Motor Manufacturing Company, Limited. In continuance of this we learn that an impression has become general that the business which the Company has carried on will be discontinued and that in consequence purchasers and owners of M.M.C. cars will be unable to obtain spare parts in the future. The Receiver and manager wishes to point out that the business is being carried on as usual, and confidently hopes will be so carried on after the Company has been wound up. In any case, the valuable repairing and sundries branch of the business with the patterns, large stock of spare parts, stores, &c., for the 1,200 cars which have been built by the Company constitutes a business in itself which, we are notified, will be continued in the future when the present Company no longer exists.

THE trade price list issued by the Midland Rubber Company for 1905 gives particulars of all the well-known tyres made by this firm, including cycle tyres, motor cycle tyres, and car tyres of all sizes. Amongst the variety of smaller articles supplied we notice a very

neat little insulating cover, called "Capit," for protecting the exposed terminals of accumulators, spark coils, etc., which should prove extremely useful to motorists.

THE Sunbeam Motor Car Company has just been formed for manufacturing the 12-h.p. Sunbeam car, this having been found necessary for the proper development of the motor car department at Moorfields, Blakenhall. Under the new company the premises will be very largely extended, enabling them to cope with the increasing number of orders which we understand they have already in hand. At present about 200 men are employed in the factory, and under the new arrangement the capacity of the works will be doubled.

THE ways of the trader desirous of attracting attention are many and varied, and in many cases take the form of useful little presents naturally bearing a reference to their origin. A very pleasant souvenir of this character is just to hand from the Molassine Company, Limited, of 36, Mark Lane, E.C., who send us in a very compact form a pair of Bridge Markers and Long and Short Whist Markers, which are so arranged that the veriest novice at these games would find it difficult to go wrong in their scores. In issuing the "Simplex" bridge markers, as they are called, the Molassine Company may claim to have themselves made so big a score that it is hardly possible for the markers issued to register it. In the ordinary course the cost of a set of these markers obtainable from them, is, the Molassine Company informs us, 10s. 6d. post free.

THE Auto Engineering Company, of North Street Garage, Leeds, advise us that they have reduced their price for petrol, and they draw attention to the fact that they give free garage to customers, their premises always being open day and night.

MR. PERCY FROST SMITH, who, it will be remembered, was for some time associated with the Motor Traction Company, Limited, the Motor Haulage Company, and the Milnes Daimler Company, Limited, and has recently been works manager for Messrs. J. B. Petter and Sons, Limited, oil engine manufacturers, of Yeovil, has resigned his position with the latter to take over the management of the engineering department of the motor omnibus section of the business of Messrs. Thomas Tilling, Limited, of Peckham. Mr. Frost Smith commences his new duties on February 1st.

THE "Orion" motor omnibus, of which we recently gave a photograph on page 61, is, we learn, fitted with Sirdar buffer tyres, which have, we understand, proved eminently satisfactory. Once or twice we have taken occasion to board this particular machine when travelling over some very greasy patches on the road, and not the slightest sign of sideslip has been noticeable.



One of the motor tricycles, which have been recently supplied to the order of the German Imperial Government, is shown in the above illustration in use in the streets of Berlin.

A New Method of Protecting Iron and Steel Articles from Rust.—In a recent number of THE AUTOMOTOR JOURNAL we pointed out the importance in motor boat construction of rendering the iron and steel portions of motor mechanism proof against the injurious effects of atmospheric influences. For parts subjected to higher temperatures we suggested an improved form of nickel plating which has been recently introduced, but there are many structural parts for which the new method recently brought out by Mr. S. Cowper Coles, who is so widely known in regard to his work in electro-metallurgy, may prove of general interest. It may be described as a species of dry galvanising. Ordinary electro galvanising with zinc is employed in certain

cases, and is effective, but ordinary galvanising consists in heating the iron or steel objects and plunging them into a bath of melted zinc. In the new process the zinc is not melted, but the objects to be galvanised are introduced into a drum in company with a quantity of zinc powder. The whole is heated to a quite moderate temperature considerably below the melting point of zinc, and the drum either revolved or turned to and fro, when the zinc powder intimately adheres to the iron or steel, giving a zinc surface which is said to be considerably superior to ordinary galvanised iron, both in appearance and in regard to its durability and its power of protecting the metal from rust or attack.

DOINGS OF PUBLIC COMPANIES. NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or part of their objects.]

Metropolitan Motor Road Car Company (Limited).—Capital, £100 in £1 shares.

Motor Cycle and Motor Car Accessories Company (Limited), 35, Lamb's Conduit Street, W.C.—Capital, £2,000 in 1,900 preference shares of £1 each and 2,000 deferred shares of 1s. each. Object, to adopt an agreement with C. Fonteyn.

Rochet and Schneider (Limited).—Capital, £300,000 in £1 shares (100,000 7 per cent. cumulative preference). Object, to acquire the business of La Société Lyonnaise de Construction d'Automobiles Rochet-Schneider, Société Anonyme, at Lyons and elsewhere, together with the stock-in-trade, &c., and to adopt an agreement with the Anglo-French Automobile Syndicate, Limited.

Southern Motor Company (Limited).—Capital, £1,000

in £1 shares (500 preference). Object, to acquire and carry on the business of a mechanical engineer, motor and cycle manufacturer, &c., heretofore carried on by W. May as May Brothers.

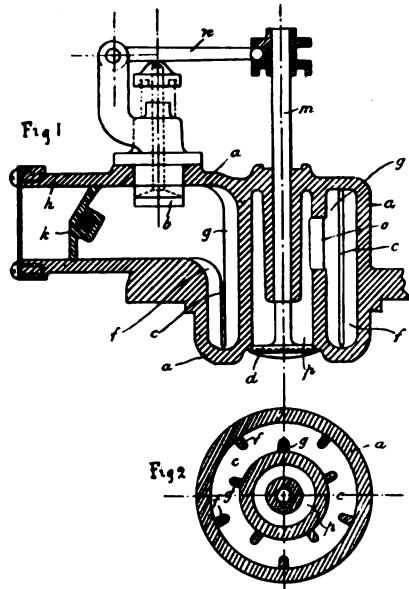
Sunbeam Motor Car Company (Limited).—Capital, £40,000 in £1 shares. Object, to adopt an agreement with John Marston, Limited, and to carry on the business of manufacturers of motor cycles, motor cars, &c. First directors, J. Marston, T. Cureton, and E. Deanesly.

United Cycle Accessories and Rubber Company (Limited).—Capital, £1,000 in £1 shares. Object, to acquire and carry on the business of cycle manufacturers and dealers in motors, carried on by H. E. Stock, at 117, Hackney Road, 302b, Wick Road, and 263, Mare Street, Hackney.

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, 232, Strand, W.C.

The first date given is the date of application ; the second, at the end, the date of the advertisement of the complete specification.

19,984. 16th Sept., 1904. Impts. in Vaporisers for Internal Combustion Engines. Lothar Koenecke, 63, Pinner Strasse, Neustadt bei Pinn, Germany. Date under International Convention, 17th September, 1903. The object of this invention is an

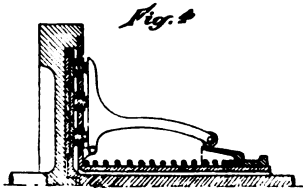


improved vaporiser for internal combustion engines, by means of which a complete mixture of air and gas is ensured, and a charge produced that, while capable of explosion under pressure, has not its temperature increased so much that it will ignite prematurely under ordinary compression. Fig. 1 is a vertical section and Fig. 2 a transverse section. A current of air enters the vaporiser, *a*, through the pipe, *h*, at every suction stroke of the engine. The pipe, *h*, has fitted the throttle-valve, *k*. The liquid fuel enters by the valve, *b*, opened by the lever, *m*, operated by the spindle, *n*, of the cylinder admission valve, *d*.

This fuel is carried along by the air into the annular chamber, *c*, formed in the valve-box vaporiser, *a*, where it is vaporised by the heat received from the walls of *a*. The fuel vapour mixes with the air to form a mixture, and then passes through the port, *o*, to the inner space, *p*, of the valve-box, *a*. Ribs, *j* and *g*, project alternately from each of the two opposite walls of the annular chamber, *c*, effecting a more intimate mixture of the air and vapour.

Jan. 12th, 1905.

25,509. Nov. 23rd, 1904. Impts. in or relating to Friction Clutches. A. J. Boulton. A communication from Edouard Oudenne, 38, Boulevard Baudouin, Brussels, Belgium. This invention relates to a friction clutch in which a gradual throwing into gear or engagement is attained by progressively bringing into action the friction surface employed. There are



five figures. Fig. 1 shows the apparatus in part section and thrown out of gear. Fig. 4 shows the position of the respective sections of the friction clutch when completely in gear ; *a* is the driving shaft carrying the flywheel, *c*, having a central boss, *s*, which fits within a recess in the end of the driven shaft, *b*. The shaft, *b*, has at its end the disc, *d*, formed by concentric rings, *e, f, g*, each fitting over the other. The inner rings are provided with peripheral teeth or lugs fitting in corresponding recesses or slots in the rings next to them. This method of mounting permits the rings, *e, f, g*, to be moved independently of one another, to and away from the flywheel, *c*, but rotating them together with the shaft, *b*, by means of the lugs or teeth. The concentric rings, *e, f, g*, of the same diameter respectively as the rings, *e, f, g*, are mounted to rotate with the driving disc, *d*, and move independently of one another longitudinally. When the spring, *m*, is compressed, by moving forward the sleeve and cone, *n*, the clutch is out of gear as shown in Fig. 1. But when the spring is permitted to thrust outwardly the sleeve and cone, *n*, which slide on the sleeve, *n*, the levers, *h*, fulcrumed at *q* by means of the arms, *w*, and the rollers, *o*, are moved

so that the springs, *x, y*, and *z*, are compressed in succession, and the rings, *h, i, j*, are pressed against the rings, *e, f, g*, also in succession. The innermost ring, *e*, frictionally engages first, then the surfaces of the two rings, *e, f*, and finally the surfaces of all the rings, *e, f, g*. The two discs thus formed of three rings each are enclosed in the flywheel by the detachable cover, *k*. The tubes, *r*, fixed to the cover, *k*, hold the spring, *x, y, z*, in position.

Jan. 12th, 1905.

NEW INVENTIONS.

Patent Specifications Published.

Applied for in 1903.

Published January 19th, 1905.

- 28,310. H. H. POWELL AND A. M. CAREY. Internal combustion engines.
28,815. D. CLERK and others. Internal combustion engines.

Applied for in 1904.

Published January 12th, 1905.

- 24,942. G. P. MAIN. Combination stands and luggage carriers.
25,078. L. BOULEZ. Electric ignition devices.
25,084. E. E. LEHWES. Self-propelled road vehicles.
25,114. J. M. DE LA CROIX AND H. F. JOEL. Accumulators.
25,413. A. VIVINUS. Clutch.
25,421. E. E. GLASKIN. Utilising exhaust gases for cooling purposes.
25,509. E. OUDENNE. Friction clutches.
Published January 19th, 1905.
134. — McCOLLUM AND — FORSTER. Turbine motors.
823. NURNBERG MOTORFAHRZEUGFABRIK "UNION." Gearing.
2,052. E. W. LEWIS. Carburettors.
3,658. — HENNING. Governing.
3,722. F. H. BOSTOCK. Speed and distance indicators.
4,563. W. J. CROSSLEY AND J. ATKINSON. Double-acting cylinders.
4,886. F. R. SIMMS. Carburettors.
9,339. W. AND H. ROSE. Exhaust silencers.
10,091. G. WEBSTER and others. Two-stroke cycle engines.
11,110. L. MERTENS. Explosion motors.
20,776. S. W. RUSHMORE. Variable speed gearing.

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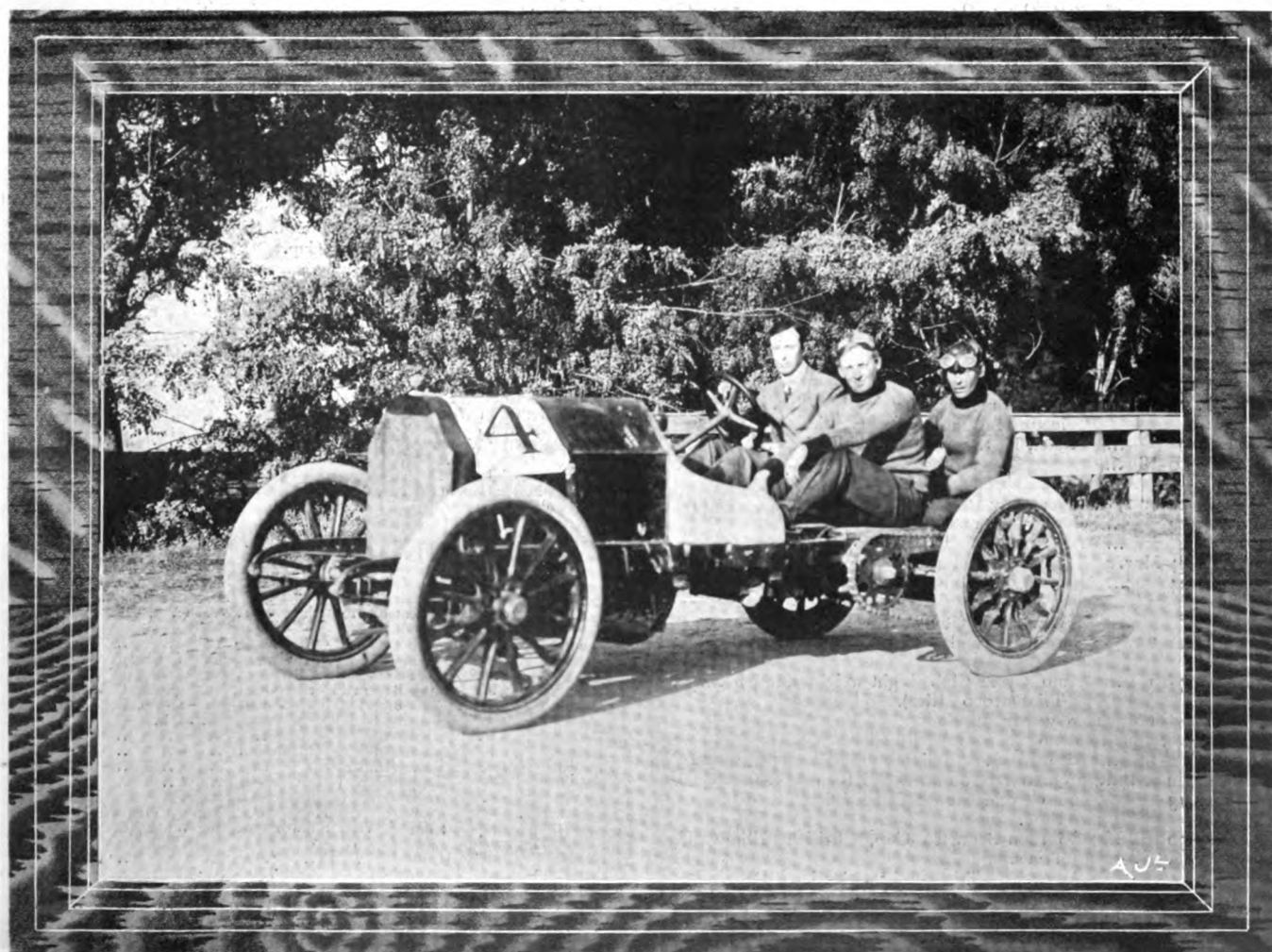
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ORMOND-DAYTONA BEACH RACE MEETING.—This meeting has this year come into remarkable prominence owing to the world's records which are reported to have been made during the past week. These we report elsewhere, so far as they have been received by cable. Amongst the latest is that of Mr. E. R. Thomas, the New York millionaire banker and horse owner, who, with a 90-h.p. Mercedes car, has lowered the 10-mile record to 6 min. 31½ sec., beating Mr. W. K. Vanderbilt's previous best on the same course last year of 6 min. 50 secs. Mr. Thomas is seen, at the wheel of his car, above, E. Hawley, his driver, being by his side,

THE AUTOMOTOR JOURNAL.

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DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
Feb. 7 ...	Motor Mountaineering in the Alps. Illustrated lecture by Capt. Deasy (Ladies' A.C.).
Feb. 9 ...	*Steel, by J. S. Critchley, M.I.M.E.
Feb. 10-18 ...	Society of Motor Manufacturers' and Traders' Exhibition at Olympia.
Feb. 10 or 17 ...	*Quarterly 100 Miles Trials.
Feb. 14 ...	Motor Volunteer Corps Dinner (Trocadero).
Feb. ...	A.C.G.B.I. Annual Dinner (Hotel Cecil).
Feb. 24-Mar. 4 ...	Edinburgh Motor and Cycle Show.
Feb. 24 ...	Manchester Motor Show.
Mar. 3-11 ...	Liverpool Motor Cycle Show.
Mar. 8 ...	*A.C.G.B.I. General Meeting.
Mar. 18-25 ...	Cordingley and Co.'s Exhibition (Agricultural Hall).
Apl. 3-10 ...	Auto Cycle Club Light-weight Motor Bicycles Trial (1,000 Miles).
Apl. 29 or May 1 ...	May Day Parade
May 6 ...	Auto Cycle Club Hill Climb.
May 11-13 ...	Scottish A.C. Reliability Trials.
May 12 or 19 ...	*Quarterly 100 Miles Trials.
May 13 ...	Auto Cycle Club Members' Penalty Run, 1s. a Stop.
May 30 ...	*Gordon-Bennett Cup, British Eliminating Trials.
May 31 ...	Auto Cycle Trials and "Selection" Race.
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.).
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 8 ...	Auto Cycle Club Consumption Trial.
July 13 ...	*Hill-Climb (Henry Edmunds Trophy).
July 19-22 ...	*Brighton Speed Races.
July 24-28 ...	*Motor Boat Trials (Southampton).
Aug. 11 or 18 ...	*Quarterly 100 Miles Trials.
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 19 ...	*Van Trials, Light and Heavy Vehicles.
Sept. 12 ...	Auto Cycle Club Race Meeting.
Sept. 14 ...	*Tourist Trophy (Isle of Man).
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).

* Automobile Club of Great Britain and Ireland Events and Papers.

Sept. 18-Oct. 3 ...	*Reliability Trials.
Oct. 4 ...	*Speed Trials.
Nov. 10 or 17 ...	*Quarterly 100 Miles Trials.

Foreign Events (Trials, Races, &c.).

1905.	
Feb. 4-11 ...	Chicago Exhibition.
Feb. 4-12 ...	Stockholm Meeting and Ice Racing.
Feb. 4-19 ...	Berlin Automobile Exhibition.
Feb. 11-25 ...	Cannes Automobile Fortnight.
Feb. 13-16 ...	Detroit Exhibition.
Feb. 15 ...	Turin Automobile Salon.
Feb. 18-25 ...	Versailles Reliability Trials (A.C. Seine et Oise).
Mar. 13-18 ...	Boston Exhibition.
Mar. 15-Apl. 9 ...	Copenhagen Exhibition.
Mar. 16-29 ...	Vienna Exhibition.
Mar. 27-Apl. 5 ...	Washington Exhibition.
Apl. 2-16 ...	Monaco Motor Boat Fortnight.
Apl. 14-23 ...	Nice Automobile Week.
Apl. 17 ...	Speed Mile and Kilometre (Nice).
Apl. 18 ...	Coupe de Caters (Nice).
Apl. 20 ...	Coupe Burton (Cannes).
Apl. 20-21 ...	Cannes Motor Boat Meeting.
Apl. 23 ...	Coupe Provinciale (Nice).
May ...	Paris Industrial Vehicles Trials (A.C. France).
May 4-12 ...	Auto Cycle Club de France Tour.
May 11-25 ...	Stockholm Automobile Exhibition.
June 18 ...	International Motor Cycle Cup.
June 26 ...	Mont Cenis Hill Climb.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Calais-London (Motor Boats).
July 30 ...	Circuit des Ardennes.
Aug. 6-9 ...	Paris-Trouville (Motor Boats).
Aug. 10 ...	Gaston Menier Cup (Motor Boats).
Aug. 11 ...	Anthony Drexel Cup (Motor Boats).
Aug. 12 ...	International Cup for Motor Boats.
Aug. ...	Herkomer and Bleichroder Races.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Vincenzo-Florio Cup.

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PASSING EVENTS.

The Retirement of Sir Francis Jeune.

AFTER a long and most unusually distinguished legal career, Sir Francis Jeune, President of the Divorce, Probate and Admiralty Courts, has decided, in consequence of failing health, to retire from the Judicial Bench. Sir Francis Jeune has, since his elevation to the Bench, endeared himself in a singular degree to the Counsel who have practised before him, by his unfailing courtesy and consideration—courtesy and consideration which he extended both to litigants and to witnesses who appeared before him. His popularity with the legal profession has been great, but his popularity in automobile circles is at least as notable. Both he and Lady Jeune have for a long time been most enthusiastic automobilists, and he has on many occasions placed his extensive experience of the road, and his pre-eminent legal abilities, at the service of the Automobile Club (of which he is a member of General Council). The delightful papers which he has read on automobiling topics before the club have proved to be amongst the most attractive and the best attended of the after-dinner series of lectures. Every automobilist will sympathise with Sir Francis Jeune on the cause of his retirement, and will hope that the pastime, of which he is so enthusiastic and experienced a devotee, will be effective at an early date in repairing the ravages upon his health which his devotion to his duties, as one of our most hard-worked and experienced judges, have made upon his vital energies.

A Sure Method of Winning.

IN the days when education was more elementary than it is at present, and "hedge" schools and schoolmasters carried on a thriving business, there was once an ingenuous small boy, who delighted his no less ingenuous father with the information that he was first in reading, writing, and arithmetic, Latin, and the various "ologies." The ingenuous father was delighted, but unfortunately, after a little reflection, asked his offspring how many boys there were in the class, whereupon he elicited the reluctant information that he was the only member of it. It would seem that this is much what is going to take place this year in regard to any rate to the Gordon-Bennett Race, and to a less extent with regard to the Grand Prix as well, and perhaps it is the best thing that could happen. If France is the only nation that enters cars for the race, then there can be no question that by France the race will be won, and that, apparently, is what the French manufacturers and the French Automobile Club desire to bring about. As we announced when going to press last week, the German Club have decided not to compete. We conclude the A.C.G.B.I. will adopt the same attitude. The Belgian Club has already withdrawn. Probably the Austrian will follow suit, and, from the energetic attitude that the Swiss Club has taken up on the question, it is, at any rate, probable that they also will retire. By its masterly diplomacy, therefore, the French Club may be regarded as having won the race before it starts. But the victory will not, we think, do them a great deal of good. In previous years, the unique value of the Gordon-Bennett Cup has been due to its character as an international trophy, for which the leading countries manufacturing automobiles competed. It would seem that the French Club, partly

by insisting on running the Gordon-Bennett and the Grand Prix together, and partly by the attitude they have assumed to the other representative clubs, have already succeeded, or will succeed, in causing all their competitors to retire in disgust. It will prove a very Pyrrhic victory and seems a short-sighted course to adopt. While ensuring that they retain the trophy, they rob the trophy of practically the whole of its value.

The Explanation of These Tactics.

THAT, however, is their affair, and we may be quite sure that the French are far too acute and far-sighted to act in such a way, without what appears to them a sufficient reason. The object at which they aim, it can hardly be doubted under the circumstances, is the practical annihilation of the Gordon-Bennett Race as an institution and a sporting event, and the erection in its stead of the Grand Prix to which foreign competitors will be admitted, not as by right and all on equal terms, as in the Gordon-Bennett Race, but by "invitation," the invitations being managed in such a way—this is freely admitted—as will amount to a powerful handicap in favour of the French competitors.

Not Sport, but "War to the Knife."

THE situation is well summed up in a letter which Mr. Claude Johnson has addressed to us in regard to his proposal for restricting the proportion of foreign entries for the British Tourist Trophy, which we gave last week, and from which we to some extent dissented. In the course of his letter Mr. Johnson observes:—

My view is this: That the Automobile Club of France have ceased to regard racing as a sport. They regard racing as part of the "war to the knife" which must exist between the various countries for supremacy in the automobile industries of the world. Seeing the commercial results which attach to the winning of a big international race, I think they are perfectly right. It is, in my humble opinion, useless for us to talk about "sport" now that automobile racing is almost entirely in the hands of paid mechanics. Furthermore, I think we are blinding ourselves, with all this fog about "sport," to the commercial results of racing. My proposal is not retaliation but protection.

I do not see why the English club should give the same favour to the foreign cars which are swamping our market as is given to the English cars. I quite agree with the French:—Let the alien cars come, but let competitions of the country be mainly for the cars of the country.

The difficulty in all our competitions is that we have too many entries. My suggestion is that in every competition the entries should be limited to a certain number, and of that number the larger proportion should be reserved for British cars. The smaller proportion should be reserved for the cars nominated by the clubs of the respective foreign countries to represent them, the proportion being five British cars to two cars from France, two cars from Germany, &c.

Every other country in the world protects its industries except this benighted old show.

To use the words "sport," "sportsmanlike," "fair play," or any of their equivalents under the circumstances now created, would, of course, be an obvious farce, and there can be no doubt that Mr. Claude Johnson is perfectly right in his contention "that the Automobile Club of France have ceased to regard racing as a sport, and merely look on it as a part of the 'war to the knife' which must exist between the various countries for supremacy in the automobile industries of the world." To a certain extent, no doubt, that has always been their attitude, and some of those who witnessed the race in Ireland in 1903 said that, while the other competitors appeared to have come out to win, the Frenchmen

looked as if they had come out to kill. But hitherto that attitude has been hidden to a certain extent under the veil of a pleasing fiction. That veil is, apparently, in future to be dispensed with. To repeat, therefore, it is little use talking, as Mr. Johnson sensibly observes, about "sport," "*noblesse oblige*," and that sort of thing, now that the important standpoint is that of commercial supremacy. We are not sure that we like accepting this position without a murmur, but even if we do accept it, it certainly seems to us that the line adopted by our French colleagues is a mistaken one. If racing in any shape or form is to maintain even its commercial value, the great events must be international competitions, and if they are to be international at all they must be freely and unrestrictedly international. It will not do for one country to invite only so small a number of foreign countries as to ensure its own success. If the French, the German, or the English have a race in which the chances are all in favour of the French, the German, or the English competitors respectively, it is obvious to the meanest intelligence that the advantage of winning such events will be extremely limited, and however much puff and advertisement may attempt to obscure the fact, the public will realise it and realise it quickly. It is for this reason and for this reason only that in our last number we adopted a rather critical attitude towards Mr. Johnson's proposal to limit the number of foreign cars admitted (in proportion to the number of British competitors) to the Tourist Trophy. It is not from any love of the foreign competitor. It is recognition of the fact that not only the sporting value of the event but its commercial value as well would be sensibly diminished by the proposals from which we dissent, which has induced us, in the interest of the movement, to subject these proposals to criticism.

What is Wanted.

It is for these reasons that we have been opposed from the first to any tinkering with the Gordon-Bennett Race—to any manœuvres or manipulations which should have the effect of depriving it of its character as a free, open, and equal international competition. For precisely the same reason, we wish to see the British Tourist Trophy a competition of the same kind, and we wish both these things because we are convinced that with them are bound up the true interests of the automobile movement. English and German manufacturers are already saying, and saying with justification, that the French are beginning to fear their competition, or they would not endeavour to handicap it. We do not in this country want to make the same mistake. As regards the Tourist Trophy, that, at any rate, is entirely in our own hands at present. *That*, the British Club can arrange and deal with as they like, and we think they will be wise, as already said, to refrain from restricting foreign competition. It is not a matter of sentiment on which we disagree with Mr. Claude Johnson. It is a matter of expediency only. Probably the international character of the Gordon-Bennett Race is annihilated as far as 1905 is concerned. The French Club evidently intends to stick to its guns. But there may be hopes of restoring it to its position in the year following. It is by what is an obvious omission in the rules, that the action of the French Club has been rendered possible. Clearly the intention of these rules, and presumably of Mr. Gordon-Bennett himself, was, that both the international character and the sporting character of the event should be

its leading features. If the representative clubs of all the countries which manufacture automobiles were to meet, say under the presidency of the donor himself, and re-model the rules for 1906 and the following years, the difficulty doubtless would be got over, and the Gordon-Bennett Cup restored to the proud position it has hitherto occupied as the "blue ribbon" of the automobile racing world. There is reason to think that Mr. Gordon-Bennett himself would not be indisposed to listen to such a proposal. Hitherto, he has always abstained from criticising in any way the management of the competition, but it is noteworthy that since the recent action of the Automobile Club de France, his paper, the *New York Herald*, has departed from this indifferent attitude, and in a suggestive article points out that the main objects for which the trophy was established were to produce international competition and a sporting event for automobiles which would acquire a classical reputation.

The Gondomobile.

For centuries the gondola has been the regular and recognised means of locomotion in the city whose streets are paved by the waters of the Adriatic. It was from their state gondolas that for upwards of a thousand years the Dukes of Venice used to "wed the Adriatic." No form of boat, or, indeed, any other means of locomotion, has been the source of so much romance, and so much intrigue. The gondola seems made for the purpose. The man who propels it with almost noiseless strokes of his paddle is perched well up on the stern, and cannot see, or presumably hear, the occupants who sit in the hull covered by the romantic hood, which seems to have been designed to favour the *tête-à-tête*. For some time past, in the water-streets of the City of Palaces, the gondola has been hustled by the steam launch. It is an undoubted desecration, and if ever there was an opening for the motor boat proper, the boat that does not disgorge black fumes from its smoke-stack, that field is provided by the canals of Venice. Already, many Venetian families, we learn, are adopting private motor boats. Let us hope that in the near future we may see the internal combustion engine adapted to the propulsion of the gondola. There are circumstances in which people would desire to dispense with even the most discreet gondolier, but the discretion of the motor is perfect. With a water-jacketed exhaust it may be made practically silent, and could be perfectly well applied to the lines of the gondola. Motor driven gondolas ought, if reasonably silent, to have a wide future before them in Venice, and would possess the great advantage of not violating the traditions of the place, which is one of the principal objections to the steam launch.

Speed of Motor Cars in the Parks.—Novel Criminal Procedure.

INTERESTING developments are promised in regard to the very important legal question of the speed of motor cars in the parks. Quite a large number of drivers have been had up at one time or another under the so-called Park Regulations, and fined for exceeding the 10-mile an hour limit, which the police, it is supposed under the authorisation of the Parks' Regulation Act of 1872, have imposed. In defending one of these cases recently at Marlborough Street, before Mr. Kennedy, Mr. Staplee Firth pointed out that the regulations in question were only valid by Act of Parliament if they had been duly

and properly laid before both Houses of Parliament. This somewhat took the magistrate by surprise, who said that in that case a number of convictions already made in that court would have been illegal. When called upon to produce the authority in accordance with which the summons was issued, the police inspector was merely able to provide some printed Park Rules. Mr. Firth produced what was at any rate *prima facie* evidence that the regulations had never been properly laid before Parliament. The magistrate was not satisfied with this evidence, and adjourned that particular case, and a number of others, pending the settlement of the point raised. We confess we are quite unable to understand this attitude. The onus of proof obviously lies with the prosecution. They may at any time be called upon, and should be ready to show that the legal authority on which they act is valid. To insist upon the defence providing the evidence that it is not, appears to be something new in criminal procedure.

A Very Pretty Wit.

On the whole, we think Mr. Swinburne is at his best when facetious. He has effected revolutions in dynamo construction, in transformer design, in electrolytic processes, and in the methods of giving evidence in patent cases. But it is probably as a humorist that he will go down to posterity, and we are inclined to believe that that is what he would really like. It is little more than a year ago since he played the part of Eris at the banquet of the gods by throwing the apple of discord, this time called "entropy," among the professors, who promptly fell upon it and rent it, and then one another. It was an egregious discussion, and the only thing that emerged clearly from it was that no two professors agreed as to what entropy meant, and that nobody but professors could understand how they differed. Mr. Swinburne has recently read a paper before the Automobile Club on the subject of Motors and London Traffic. The paper will add to his reputation as a humorist. Mr. Swinburne makes no secret of his qualifications as a lecturer to the club. He candidly declares that he has never driven a motor more than 100 yards, and he suggests, though he does not state, that after this essay "there were gathered up of the fragments thereof twelve basketsful." He further added that he was probably the only member of the club who did not possess a motor of some sort, and he further commended himself to the appreciation of members by the statement that he was informed there was some pleasure in being driven and especially in driving a motor car, *but that he did not believe this*. In some respects Mr. Swinburne's views are restricted. No doubt motorists look at most things from the "motor point of view," but when he tells us that he has never yet met a motorist who could treat any subject, "from religion to mixed bathing," from anything but a motor point of view, he is separating things which are essentially one and indivisible, for is it not from the religious point of view that the question of mixed bathing is invariably considered? Altogether, Mr. Swinburne's paper was a study in perversity. But he made excellent fun (and wisely) of the principles which we seem to have adopted as axioms, that roads should be made durable, quite irrespective of the injury they inflict on the vehicles that use them, that local authorities are to be considered omnipotent, and that highways which were adequate to the restricted traffic of a hundred years ago are of any serious value now. It is, at any rate, interesting to learn that years ago Mr.

Swinburne advocated the claims of the motor omnibus in preference to those of the electric tram, but that his views were ridiculed, and that it is only since Colonel Crompton (at whom nobody laughs) has adopted the same opinion, that this contention has been regarded seriously.

The Possible Future of the Marine Motor.

No one has a higher reputation as a marine architect than Sir William White, the former Director of Naval Construction. He it is, at any rate, who is responsible for the great majority of our more modern battleships, and if this country is ever engaged in a great naval war its success or failure, as the event may prove, would in either case be largely due to the principles adopted by Sir William White. His views, therefore, as given in his speech at the opening of the Crystal Palace Automobile Exhibition, of the applicability of the internal combustion engine to marine propulsion are of the highest possible value and interest, and every motor boat builder will consequently be delighted to find that so high an authority considers that the adequate application of such engines to our larger vessels will mean the attainment of speeds far in excess of anything that has been yet accomplished. The reason, of course, is the enormous economy of weight for the same amount of power. A large proportion of the weight which an ocean liner, and even a battleship, has to carry consists of the metal employed in the boilers and other parts which the steam plant possesses in excess of the internal combustion engine. In fact it seems probable, according to Sir W. White, that the same power can be obtained with an explosion engine at an economy of five-sixths of the total engine weight. There appear to be reasons to think that, in the case of Trans-Atlantic liners, such a reduction of weight, and the corresponding economy of space for coal supply, might mean a reduction of the actual time of crossing to something like three days. This would indeed be a revolution which, if the internal combustion motor is successful in accomplishing, would throw into the shade most of its previous exploits.



BOMBAY EXHIBITION AWARDS.

THE awards to exhibitors of motor cars at the Bombay Industrial Exhibition are announced. The special Gold Medal for the best car in the Show has been awarded to Count de Gropello's Fiat, and a special silver medal for a native-built car goes as a mark of appreciation to Mr. Adamji M. Ismailji's "Indian Motor." The other awards are:—

CLASS A (8,000 rupees and over).

Fiat car, 1st gold medal; De Dietrich car, 2nd gold medal; Thornycroft, 1st silver medal; Lanchester, 2nd silver medal.

CLASS B (4,000 to 8,000 rupees).

Darracq, 1st gold medal; Orleans, 2nd gold medal; Argyll, 1st silver medal; Clement-Bayard, 2nd silver medal; Humber, 3rd silver medal.

CLASS C (4,000 rupees and under).

Two Wolseley cars, 1st gold medal; Minerva, 2nd gold medal; Humberette, 1st silver medal.

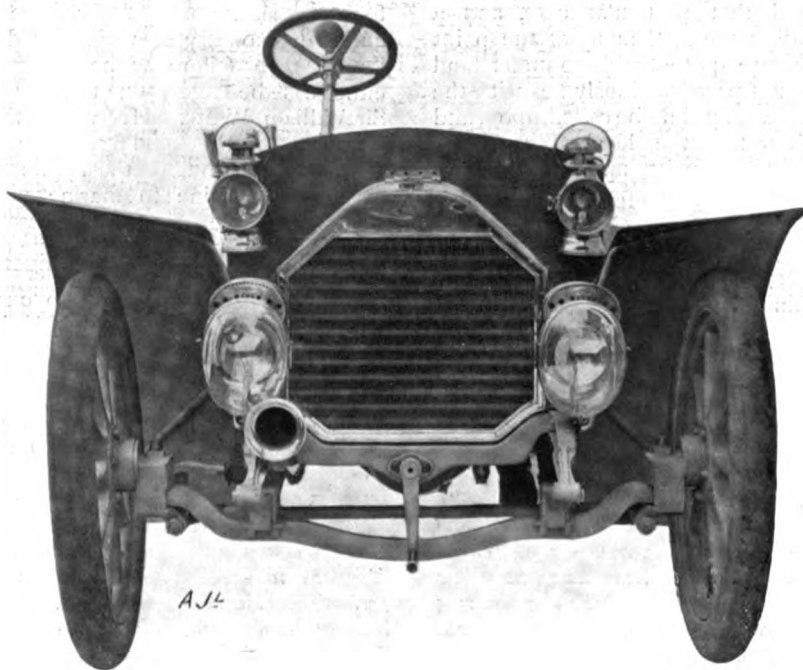
The judges were Col. A. F. Milne, I.M.S., Capt. Swinton, I.M.S.; Mr. A. Morton Bell, M.I.M.E., Mr. R. W. Hogarth, C.E., and Mr. T. S. Dawson, Professor of Engineering at the Victoria Technical Institute. Thirty-two cars were entered.

THE 20-H.P. BROTHERHOOD PETROL CAR— ANOTHER NEW ALL-BRITISH VEHICLE.

FROM all appearances, it would seem that even those who hold the most pessimistic views concerning the progress that is being made by manufacturers of automobiles in England will very shortly be compelled to admit that this country is very far from having lost that enterprising spirit and that constructive skill which has hitherto enabled it to attain so high a position in the world in all branches of engineering. Nothing, at any rate, could be more satisfactory than the way in which famous firms who have, in the past, won their laurels in other branches of mechanical engineering, and have now taken up the work of building motor cars, are increasing in number, for it is they who can best bring to bear upon the new English designs that same sure—if slow—thoroughness which has already stood the country in such good stead. One concern of this kind after another has devoted its attention to the new

industry, so that the prospects of being able to obtain even better cars at home than abroad are continuing, year by year, and almost month by month, to become yet brighter. At the same time, moreover, it is specially gratifying to see that there is nothing like so great a tendency for the latest British models to be, as is largely the case abroad, mere copies of some particular existing model—however successful (in comparison with other known types) that model may have been up to now.

There are, at any rate, especially good grounds at the moment for taking a very optimistic view of the situation, for it is our pleasant duty this week to record the appearance of an exceptionally promising new British car, to which we feel quite justified—after having made a careful study of its entire construction—in according a most hearty welcome, since we believe that it is destined to



Front View of the 20-h.p. Brotherhood Petrol Car.

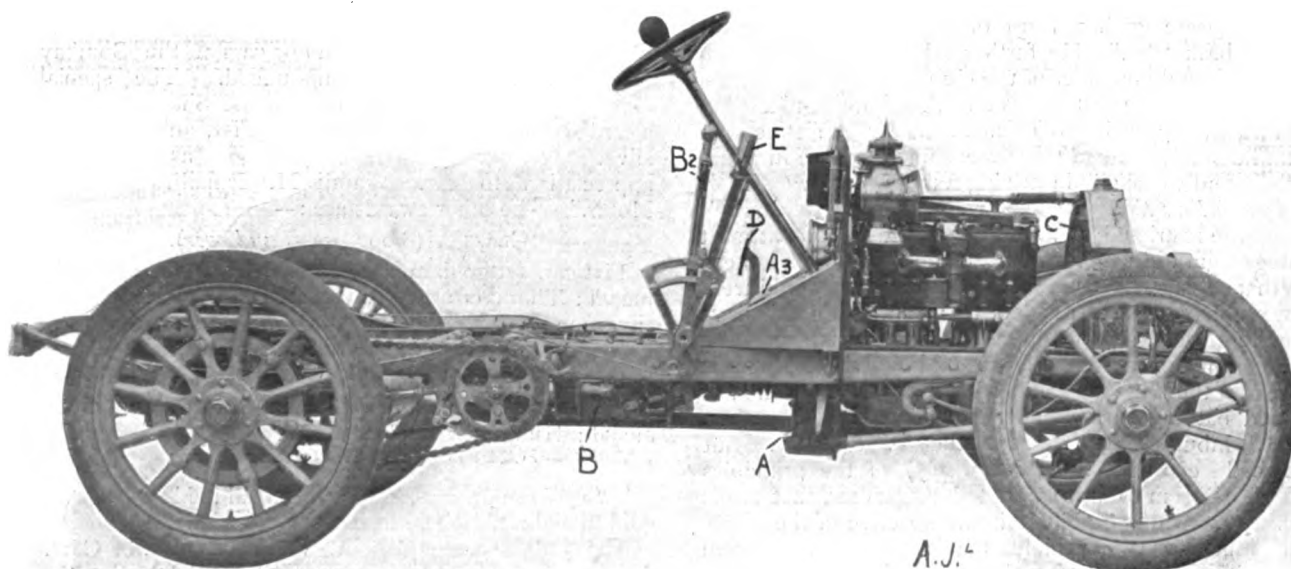


FIG. 1.—Side View of the 20-h.p. Brotherhood Chassis.

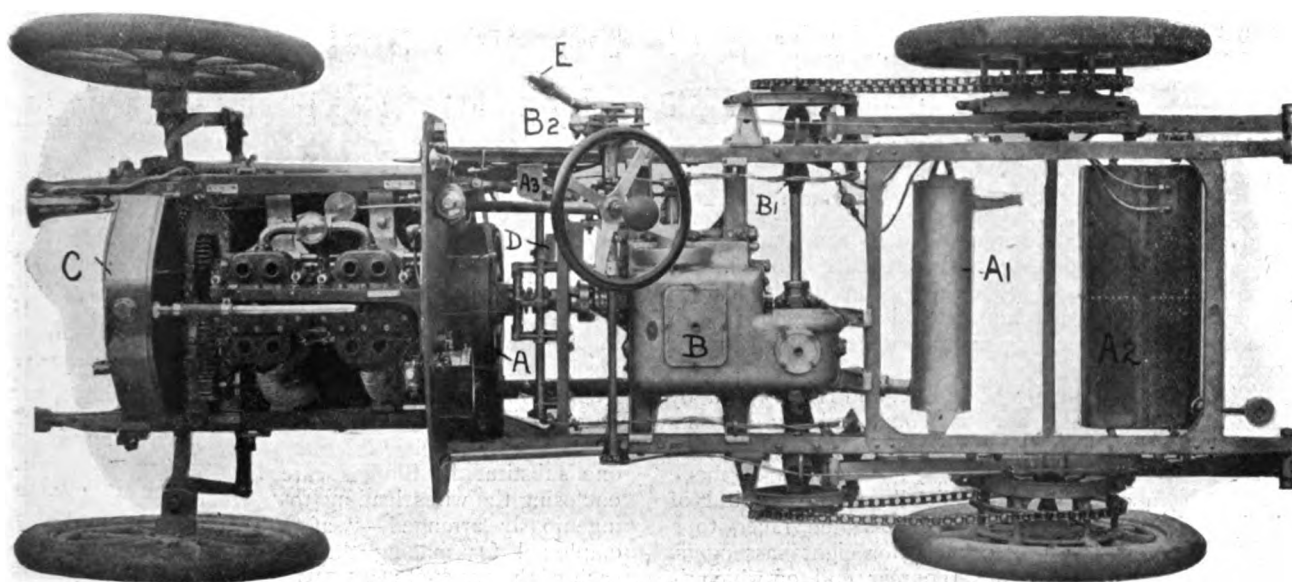


FIG. 2.—View of the Brotherhood Chassis from above.

take a high place in the ranks of first-class British automobiles. The builders of the Brotherhood car—Brotherhood-Crocker Motors, Limited—although a separate business concern, practically constitute the automobile branch of the well-known and old-established firm of Peter Brotherhood, whose reputation as manufacturers of high-speed engines and other machinery of a similarly high-class kind is probably second to none, and who are—in their exceptionally well-equipped works near Westminster Bridge—manufacturing all the engines, the gear-boxes, and certain other important parts for these new cars. These vehicles, which are of British construction throughout, are also being introduced under other particularly auspicious circumstances, for their design and construction has been carried out under the supervision of Mr. Percy Richardson, the firm's general

manager, who, as many of our readers know, has been connected with the automobile industry in this country since the first, and has had exceptional opportunities for studying the exact requirements of purchasers.

Although based on well-tried and accepted lines, the new cars have many novel features, which render them different in quite a number of important respects from any others already on the market. They are, however, by no means of an experimental nature, for each and every part has undergone a lengthy series of exhaustive tests, and a completed trial vehicle has, for some months, been in almost continuous use, performing long-distance runs on all and every kind of road, and in every sort of weather. The main objects aimed at have been to produce as perfect a car as possible for use in the hands of the ordinary driver, by taking the best features of those

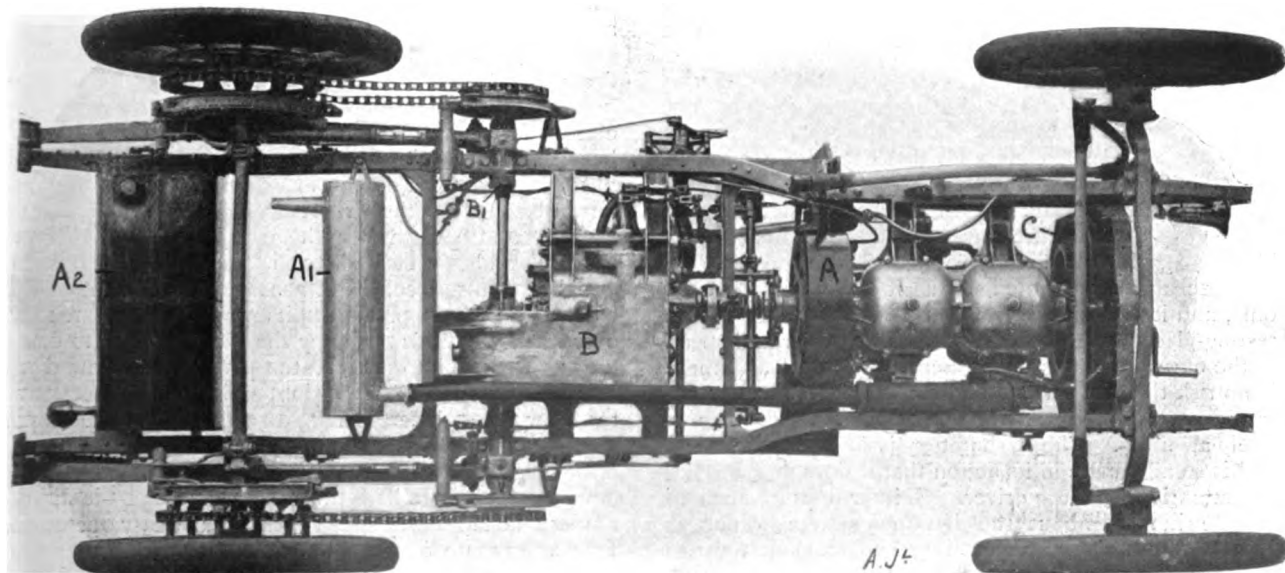


FIG. 3.—The Brotherhood Chassis as seen from beneath, with the "Under-Bonnet" removed from below the Engine.

that have already proved their merits, and by systematically trying to modify the design where they appeared to be open to improvement. To this end, every endeavour has been made to reduce the number of the controlling levers without curtailing the car's capabilities, while, at the same time, simplifying each and every part of the entire mechanism, and rendering it extremely accessible. Further than this, the importance of being able to supply interchangeable spare parts at short notice—and even after alterations may have been made in the Company's standard designs—has been recognised, with the result that each separate portion of the car is stamped with a special number which corresponds with the filed working drawing in accordance with which it was made.

The car is nominally of 20-h.p., and is propelled by a 4-cylinder engine that is connected by a cone-clutch, a four-speed and "reverse" gear, and by side chains, with the rear wheels. The chassis is made in three standard lengths, to suit all and every kind of body, from one suitable for a two-seated racer, to a wagonette with a seating capacity for eight passengers. It has a pressed steel frame, the rear end of which is curved upwards, with the three-fold object of improving the general appearance of the complete car, of permitting a perfectly straight back axle to be employed, and of improving the accessibility generally in front. The frame is also narrowed considerably forward of the dashboard to give a very wide angle of lock for steering, and thus the car is rendered very easy to manoeuvre in short and narrow spaces. An unusual feature of the steering gear is that provision is made for varying the rake of the steering pillar—to suit any individual driver, and another even more striking departure from ordinary practice in car construction is that all four side springs are fitted with oilways, and with lubricators, that allow oil to be introduced between the leaves forming them; they can thus continue to slide properly against each other, and will not become deadened by sticking together after they have been in use for a short time. Except so far as thrust bearings are concerned, the only ball bearings employed on the car are those for the road wheels, and these are of the special "Hoffmann" type, in which there are two rows of balls to take all end-thrusts, in addition to the two rows that take the weight of the car on the axle.

The engine is provided with a variable-lift device acting on the inlet-valves, but otherwise it does not differ radically from other up-to-date models of the 4-cylinder type. The methods that have been adopted for enabling it to be controlled solely by one foot-pedal are, however, especially noteworthy, particularly as the engine has no automatic governor of the ordinary kind. The pedal, which is directly connected with the variable-lift mechanism, is pivoted so that it can move sideways only, and it has side-plates that render it a convenient resting-place for the driver's foot. The power and speed of the engine are thus under complete control, and there is no risk that the driver will alter the adjustment unintentionally through pressing down upon the pedal instinctively at times. The carburettor is of special design, and is so automatic in its action that it does not require any attention from the driver. Neither does he need to trouble himself about the ignition system, which is "timed" entirely by a centrifugal governor that varies it in accordance with the speed. Although not in any way delicate, the carburettor maintains an approximately correct richness of the mixture in spite of the wide ranges

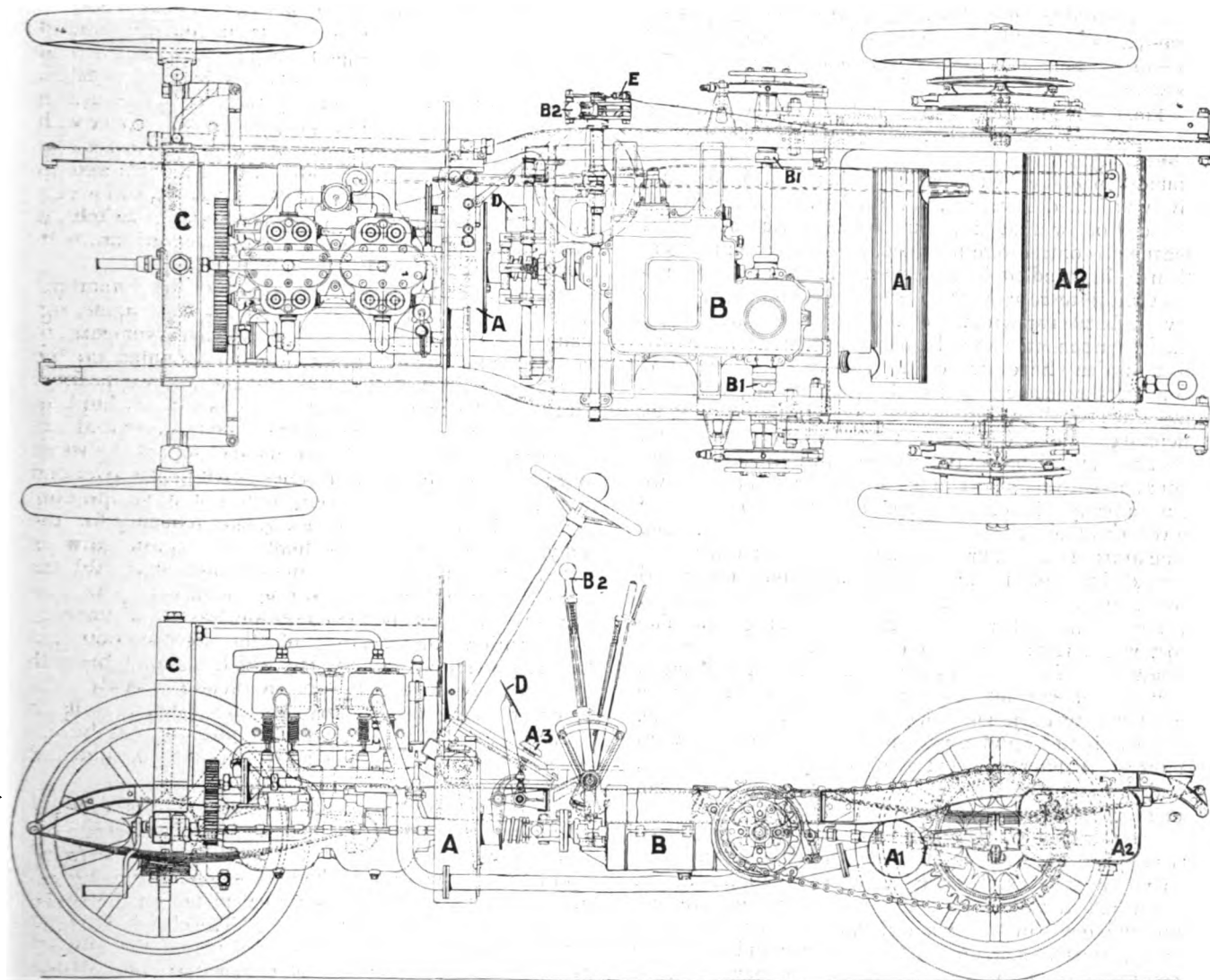
of "torque" and of speed possessed by the engine. At the same time, it does so without materially reducing the possible output of the engine at high speeds, while, as will be seen from the more detailed description which will be given presently, a special feature is that the petrol-feed, as well as the air supply, are simultaneously regulated by it. Not only is the ignition system rendered particularly interesting, in consequence of the automatic "timing," already mentioned, but it possesses several other more or less novel characteristics which cannot but prove to be useful refinements. A very well-designed distributor is fitted in such a way as to be at all times visible to the driver, and this is used in conjunction with a single trembler coil, any individual portion of which is separately detachable or replaceable. The trembler complete with its base, for instance, can be removed in a few moments, or the coil proper with its condenser can be slid out of the casing and a new one substituted. Similar care has been bestowed in enclosing the wires leading to the cylinders, and a very ingeniously arranged—"safety spark-gap"—switch is employed for making the necessary connection with each of the spark-plugs.

Equal attention has been paid to the important questions of lubrication and of cooling the engine, the makers having introduced certain improvements to ensure both. The lubricator, which is mounted on the dashboard, is mechanically driven, and gives a positive feed of oil through each pipe. The radiator is built up of a large number of horizontal finned tubes that are connected together in a special manner so that the water flows through these tubes in series; each tube is arranged so that the air passes properly round it, while the construction is such that there is a greater tendency for the water to flow through the front—the coolest—row of tubes than through the two rows behind it, should the supply of water be at any time reduced. The circulating pump also possesses certain features of novelty, and another characteristic of the Brotherhood car is that the protecting sheeting which is fitted beneath the engine is constructed in almost exactly the same way as an ordinary air-tight bonnet; it is hinged centrally at each end to castings that bridge across the frame, and is readily opened up or removed as may be required.

Possibly the distinctive feature of these cars that will at first attract most attention from the public is the arrangement of the change-speed-lever. The gear itself follows closely on the well-known Mercedes lines, except that it has self-oiling plain bearings instead of ball bearings, but the lever which operates it—giving either of the four forward speeds or the "reverse"—does so when moved forwards and backwards in the *same* central slot. Either the first and the second, or the third and the fourth, speeds are introduced by it, according as to whether the handle—which is pivoted to its upper end—is rocked over *outwardly* or *inwardly* by the driver; while, to bring the "reverse" into action, the handle is allowed to remain in its upright position, and it is only necessary to draw the lever back a considerable distance. The arrangement is certainly simple, and gives a very positive action, while—as far as can be judged without having actually handled the car on the road—it should render all changing of speed a particularly easy operation. It is, at any rate, impossible to "run through" an intermediate gear by mistake, or to experience any difficulty when driving in the dark. A further very important feature possessed by the mechanism is that the hand-lever,

and each of the sliding parts in the gear-box, are effectively locked when left in either of their working positions. Other respects in which the gear mechanism is worthy of notice, are:—that the gear-box is constructed so that either of the shafts can be removed without involving any unnecessary work, that the box itself can be taken down without disturbing either the main clutch or the outside bearings for the countershaft, and that the chain-sprockets can at any time be changed in quite a short time, since each of them is only held in place by four bolts. The large chain-wheels are also

inside the sprocket-wheels—and the other pair are, as usual, on the road-wheel hubs. Each of them has two semi-circular band-shoes that are forced together by a powerful toggle action to give an even pressure almost entirely around the drum, and they are normally held apart by a scissor action that keeps both of them clear of the drum, besides preventing any rattling. They have renewable metal friction surfaces; each pair of brakes is connected together by a compensating device; and either brake can be easily adjusted. Another useful feature is that the drums can be removed without dis-



FIGS. 4 AND 5.—Plan and Side Elevation of the 20-h.p. Brotherhood Chassis.

fixed to the road-wheels in a somewhat unusual manner, for care has been taken to prevent any distortion of the road-wheels—through shrinkage of the wooden spokes or other causes—from throwing the chain-wheels out of truth with the axle. Between the chain-wheels and the metal hubs are introduced steel driving disks that form a rigid connection, and the chain-wheels are only secured direct to the spokes by bolts that pass through slotted holes in them.

No part of the Brotherhood car has received more careful attention than the brakes, one pair of which are fitted on the ends of the differential countershaft—just

turbing the band-shoes, and thus either of the rear road-wheels, or either of the countershaft-ends, can be taken away without interfering with the brake-gear.

From what has already been said, it will have been realised that one of the most important differences between the Brotherhood and other vehicles is the system of control, and the way in which the number of levers and pedals that require to be operated by the driver have been reduced. As a matter of fact, nothing is more striking than this important characteristic, and Mr. Richardson is to be congratulated on having so far realised his aspirations in this direction that the all-

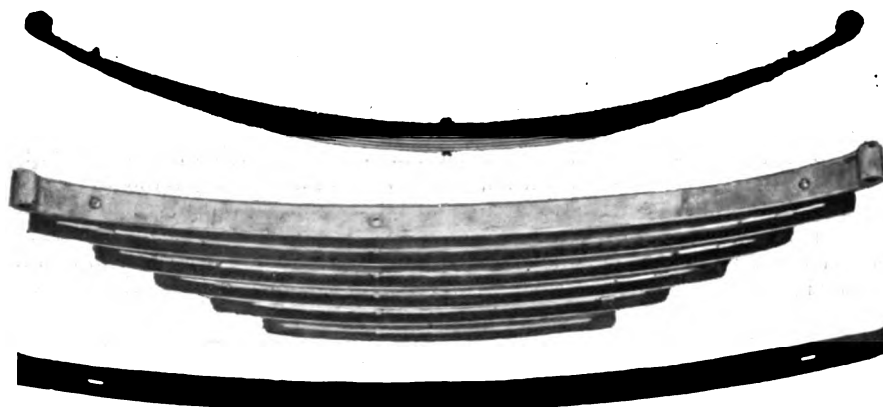


FIG. 6.—The Brotherhood Lubricated Spring, showing one complete Spring, one with the Leaves separated, and a view of a single Leaf alone.

round capabilities of the car in the hands of a comparatively unskilled driver are, nevertheless, hardly, if at all, reduced below what they would be if the usual additional means of control were provided, and if the vehicle were then to be handled by an expert. There are two foot-pedals, and there are the two usual—gear and brake—side levers, but, apart from these, there is nothing, unless indeed one mentions the bulb of the hooter, which projects up in the centre of the steering wheel, and is connected with the hooter itself through the tube forming the steering pillar. The pedal on the left, when depressed, disconnects the main clutch in the first instance, and if pressed down still further, applies the countershaft brakes. The pedal on the right is, as we have already said, only capable of sideway motion. The pivot point for it lies beneath the driver's right heel. The amount of mixture that the engine can draw from the carburettor is, in this way, entirely controlled by swinging the right foot outwards or inwards, using the heel of the boot as a fulcrum point. The toe, which rests in a kind of cradle, may be pressed down upon the pedal to any desired extent without in any way affecting the control action, so that a very great nicety of adjustment is apparently obtainable, since it is not only easy to move one's foot sideways either quickly or slow, but also to "lock" it accurately, and without effort, in any desired position. As will be seen, the right hand is entirely free for blowing the hooter, for changing speed, and—in case of emergency—for applying the hub-brakes, for there is never any need to remove the left hand from the steering-wheel, since the usual duties of regulating the throttle-valve and the time of ignition—by additional small hand-levers—are eliminated, and no hand control is required by the carburettor. At first sight, possibly, it may be urged that the best results cannot be obtained from any petrol car unless the driver can himself control the time of ignition, and that there are certain times when the absence of an automatic governor is disadvantageous. The first of these possible objections might be true if the Brotherhood cars were intended for racing purposes, when it is important that the highest possible speeds could be indulged in at all times. But since this is by no means the case, and as it

is really only important that the time of ignition should be strictly correct at those times that the engine is developing its maximum effort—when hill-climbing—all real requirements in this respect are complied with if the time of ignition is made to accord properly with variations of engine speed. On the other hand, however, it may be said that very good grounds would exist for adopting the Brotherhood system, even if slightly inferior all-round results—so far as speed capabilities are concerned—were to result, for it is probably not too much to say that more harm is done by most drivers of

petrol cars through advancing the time of ignition to too great an extent, than in any other way. There are only too many, even amongst those who are really efficient drivers, who are apt to err in this way.

Although, in the foregoing paragraphs, mention has been made of the more noteworthy and distinctive characteristics of the Brotherhood car, yet there are many other—if minor—points of interest in its design, which may be gathered from our numerous illustrations—some of which we give this week—or obtained from a study of the more detailed treatment that we shall bestow on the chief parts in our next issue. In point of view of workmanship, material, and finish, this new type of car compares favourably with any that are now on the market, and every effort has wisely been made to render it as good in these respects as possible. Each individual engine, and each complete car, are thoroughly tested for output at each speed and for capabilities under all ordinary working conditions, respectively, before leaving the factory, and the company have made arrangements with well-known carriage builders for supplying high-class bodies of whatever kind may be required.

The engines develop their normal power when running at 900 revs. per min., and they are capable of giving fully 24-b.h.p. at about 1,150 revs. per min. Ample power is thus available for all and every kind of touring vehicle, and, since it is quite a simple matter to change the sprockets on the countershafts, the cars can be geared just as high as is required. The usual range of standard sprockets enables the top speed to be from 28 to 45 miles per hour when the engine is running at 1,000 revs. per min.; this being calculated on the basis of having 34-inch driving wheels. The chassis is sufficiently strong for, and the springs permit the use of, solid rubber tyres, instead of pneumatics; one of the first vehicles which is being supplied—a landaulette for Countess Amhurst—has 34 by 4-inch De Nevers tyres.



FIG. 7.—Views of the Rear, and of the Front Axles on the Brotherhood Car.

(To be continued.)

THE BELSIZE —ALL BRITISH— PETROL CARS.—PART II.

The 3, 4, and 6-Cylinder Models.

THESE larger vehicles only differ from one another in the size and strength of the various parts, and in the number of cylinders with which the engines are provided, so that the illustrations which we give of the 3-cylinder 18-24-h.p. model, will also serve to explain the construction of the larger types as well. The chassis is shown from above and beneath respectively in Figs. 3 and 4, and is, as will be seen, of much the orthodox "live-axle" type. The pressed-steel frame is constructed with an underframe that carries the engine and the gear-box, and it is supported upon very long side springs. The inner ends of all the springs are fitted with guides, which enable them to slide freely, instead of with shackles. The rear springs lie outside, instead of beneath, the main frame, and their projecting ends are hinged direct to the spring-horns, so that no radius-rods are needed for tying the axle to the frame; the springs, consequently, not only have to take the weight of the car, but also the "drive" and the "torque" of the axle.

accurately in mesh with the bevel-wheel, J^2 . It will be noticed that the external ball-races, K^4 —one of which is shown separately in Fig. 5—has one row of balls arranged inside it, and another row pressing up against its face. This compound bearing is, therefore, able to take the thrust of the bevel-pinion, K^2 , without permitting any end play to interfere with the proper position of that pinion, or with the proper action of the internal rows of balls.

The "live" shafts, J , which carry the road wheels at their outer ends, are provided with roller bearings, J^4 , one of which is seen separately in Fig. 6, and there is also a ball-thrust bearing, J^5 , introduced behind the bevel-wheel, J^2 .

At each end of the axle, one internal (J^6) and one external (J^7) brake-band is carried by the casing, J^3 , these acting on the inner and outer faces of a brake-drum which is rigidly fixed to the hub of the road wheel. Each pair of brakes is connected together through a compensating chain and a system of levers, as seen in Figs. 3 and 4, the external pair being operated by the



A 3-Cylinder, 18-24-h.p. Belsize Car, fitted with Side-entrance Body.

The front-axle is a solid forging, and the stationary portion of the back-axle is formed by two aluminium castings.

The actual construction of the "live" rear-axle is well shown in Fig. 5, in which the internal differential-shafts, J —together with the differential-gear, J^1 , and its bevel-wheel, J^2 —have been removed from the stationary casing, J^3 . The short shaft, K , which forms a continuation of the propeller-shaft, and is driven by the universal-joint, K^1 , is also shown separately in the illustration, this shaft having a special combined "load-carrying" and "thrust" ball-bearing arranged between its bevel-pinion, K^2 , and the universal-joint, as seen. The extreme end of the shaft, K , is supported by the bearing, K^3 , so that the bevel-pinion, K^2 , is at all times kept

hand-lever, and the internal pair by the usual pedal. The construction of the steering-gear is shown in Fig. 6, in which it will be noticed that the steering pillar, L , is provided with a screw thread, L^1 , about which works the specially-shaped nut, L^2 . This nut is prevented from rotating, by the projections that form guides for it in the casing, and teeth are cut upon its face to form a rack, with which meshes the toothed segment, L^3 . This segment is fixed to the projecting steering arm, L^4 , that is connected in the usual way with the front wheels. The lever L^4 , and its segment are supported by bearings at each side, and eccentric bushes are fitted in the bearing to enable any back-lash, between the teeth, to be taken up. The steering pillar is hollow, and down the centre of it pass two concentric tubes that connect

the small hand-levers above the steering wheel with the "timing" gear and with the throttle valve. The concentric tubes have a coarse threaded feed arrangement for giving the necessary up and down motion of their lower ends.

The change-speed-gear gives three forward speeds and a "reverse," with a direct-through-drive on the top speed, while provision is made by which the lay-shaft—

part of the sleeve, M^2 , are clutch-jaws, M^3 , that can be brought into engagement with corresponding jaws on the shaft, M^1 ; these latter jaws are cut in the centre of the spur-wheel, M^6 , which is rigid with the shaft, M^1 . Although the lay-shaft is not visible in our illustrations, yet the wheels, M^7 and M^8 —which correspond with the wheels, M^3 and M^4 , on the other shaft, and are fixed to the lay-shaft—are clearly seen, as also is the wheel, M^9 ,

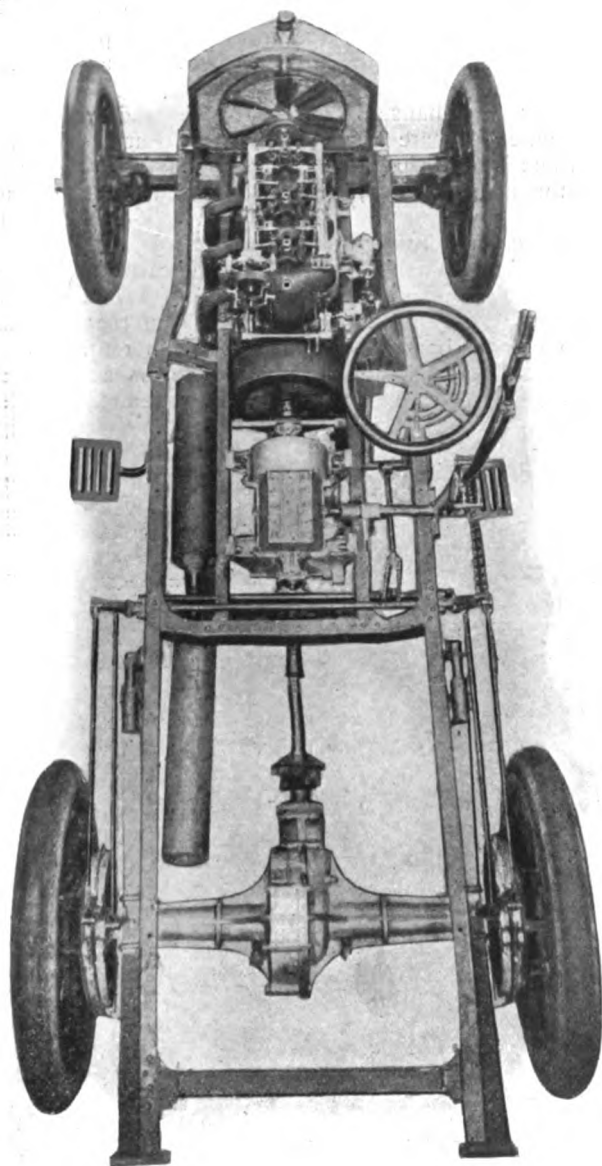


FIG. 3.—View of the 18-24-h.p. 3-cylinder Belsize Chassis, from above.

which lies immediately above the direct-through-shaft—is only caused to revolve when the lower speeds are in use. A view of the gear-box, with the base casting removed, shown from the underside, is given in Fig. 7, where it will be noticed that the shaft, M , which is connected direct with the male member of the cone-clutch, has a square cross-section where it passes across inside the gear-box. Its extreme end takes a bearing inside the shaft, M^1 , to which is attached the universal joint member for connection with the propeller-shaft. Mounted so as to be free to slide on the square portion of the shaft, M , is the sleeve, M^2 , to which the "first" and "second" speed wheels, M^3 and M^4 , are fixed. Also forming a

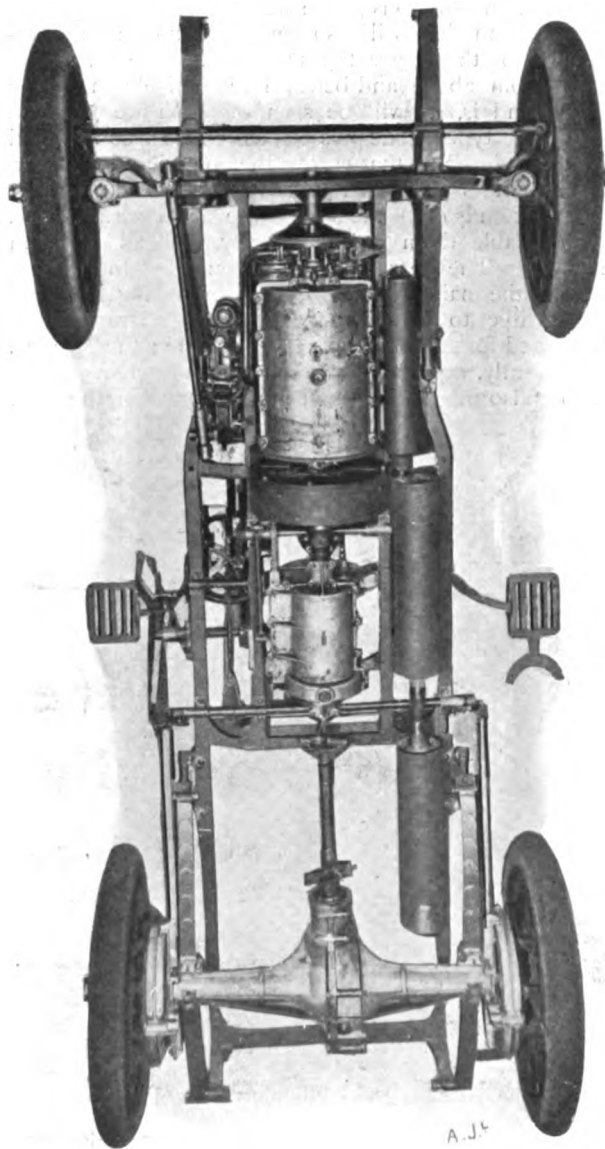


FIG. 4.—The 18-24-h.p. Belsize Chassis, as seen from beneath.

by which the "reverse" gear is obtained. This wheel, M^9 , is at all times in mesh with the intermediate pinion, M^{10} , and this pinion is so fitted that the wheel, M^4 , on the through-shaft can be brought into mesh with it.

The gear is operated by the sliding-bar, N , which is externally connected with the change-speed-lever, and is, inside the gear-box, provided with the forked-arm, N^1 , that engages with the sleeve, M^2 . It will also be noticed that a kind of cam-face, with a tooth resembling that of a spur-wheel, is formed on the bar, N , at the point marked, N^2 , and that a corresponding cam-plate, N^3 , is mounted on a rock-shaft that passes upwards inside the box. This shaft is, at its upper end, fitted

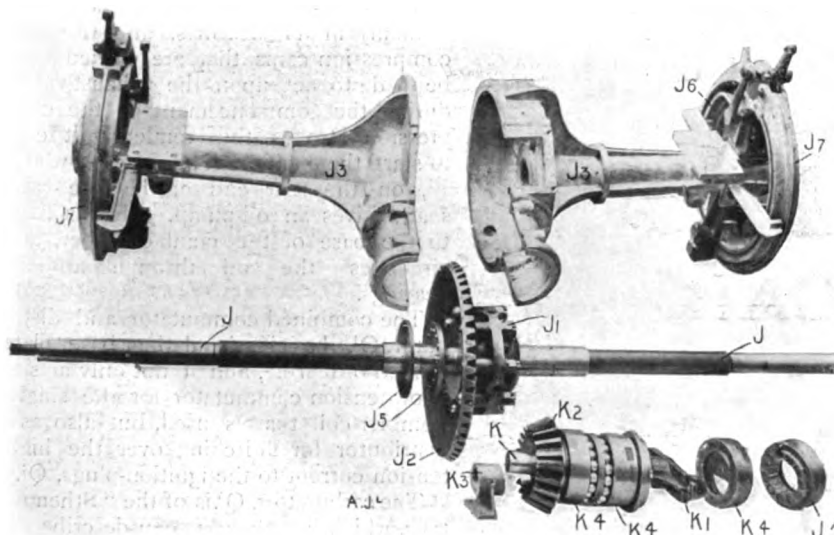


FIG. 5.—The live-rear-axle of the 3-cylinder Belsize Car, taken to pieces to show its internal construction.

with a fork which engages in a grooved sleeve to which the spur-wheel, N^4 , on the lay-shaft is secured, and thus the rock-shaft can be made to bring the wheel, N^4 , into mesh with, or withdraw it from, the wheel, M^6 . These parts are so arranged that the wheel, N^4 , normally meshes with the wheel, M^6 , until the cam, N^3 , on the sliding-rod, N , comes into contact with the cam-plate, N^5 —when it withdraws it—the result being that the lay-shaft is entirely disconnected from the direct-through-shaft at the same time that the jaws, M^5 , are made to engage with the corresponding jaws, inside the wheel, M^6 . When the car is thus travelling on the top speed, the lay-shaft is consequently stationary, but, before the sleeve, N^2 , is moved back to the “second”-speed position—in which the wheel, M^4 , meshes with the wheel, M^6 —the wheel, N^4 , has again been slid into mesh with the wheel, M^6 , where it remains for the lower speeds.

The universal joints that are fitted between the two ends of the propeller-shaft and the two shafts, K (Fig. 5), and M^1 (Fig. 7) respectively, are extra large, and have carefully hardened wearing surfaces. The shaft too, is, as usual, rendered telescopic by the introduction of a square coupling socket at its front end, as seen in Figs. 3 and 4.

The 3-cylinder engine is shown from two opposite points of view in Figs. 8 and 9, in the former of which the exhaust-valves, Q , are on the right side, and the inlet-valves, P , on the left side, while in the latter, these valves lie to the left and right respectively, as they actually do on the car. The valves are all fitted vertically into the cylinder heads down from above, the pair for each cylinder being held in place by a yoke and a single nut. Either valve is in this way easily removable, complete with its seat, and the gases find their way in and out through them without having to traverse a circuitous course. The ports leading to the valves, from the outside, are formed in each cylinder casting, as seen in the illustrations, so that the branched induction pipe, P^1 , and the separate exhaust-pipes, on the other side, lie conveniently out of the way. In Fig. 8 the exhaust-pipes have been removed, but in Figs. 3 and 4 it will be seen that the three separate pipes

are led to an expansion-chamber low down alongside the engine, and that the burnt gases afterwards pass through two silencers in succession.

The cylinder castings are formed with large water-jackets, into the bottom of which the water is led by the pipe, P^2 , on the right side, and out of which it is led by the pipe, P^3 , in front. The connection between each jacket and the pipe, P^3 , is made by the castings, P^4 , which also serve to tie the cylinders together, and to support the shafts carrying the rocking levers that actuate the valves.

There are separate cam-shafts arranged on each side of the engine, one for operating the inlet-valves and the other the exhaust-valves; the gear-wheels that drive them—as also the centrifugal governor on the front end of the former—are completely enclosed in front. The

circulating pump is also mounted on the front of the chamber, and is driven direct by the engine; it is visible in Fig. 8. The cam-shafts actuate the valves through intermediate bell-crank levers that are enclosed in neat castings, fitted immediately above the cam-shafts, and,

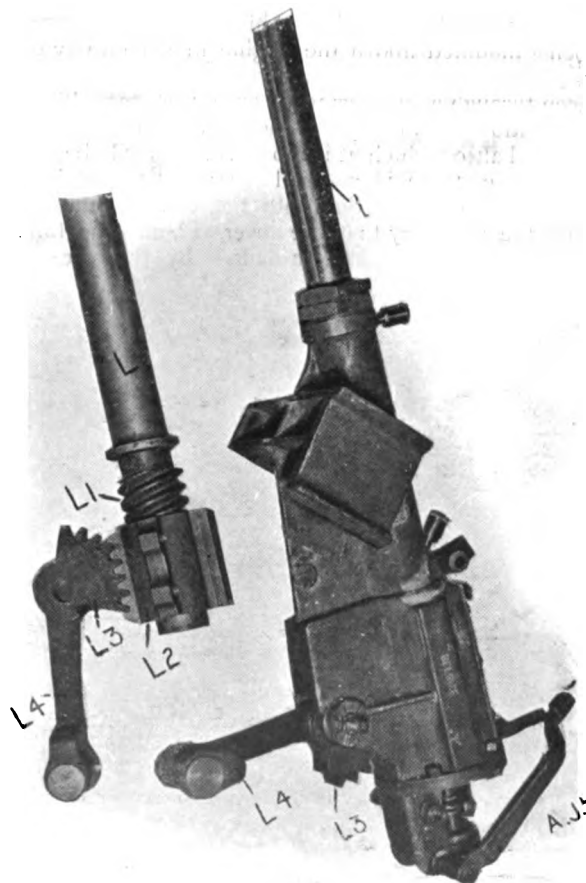


FIG. 6.—The Belsize Steering Gear. The view on the right shows the complete gear in its casing, while to the left is seen the combined feed screw and toothed-rack-mechanism separately.]

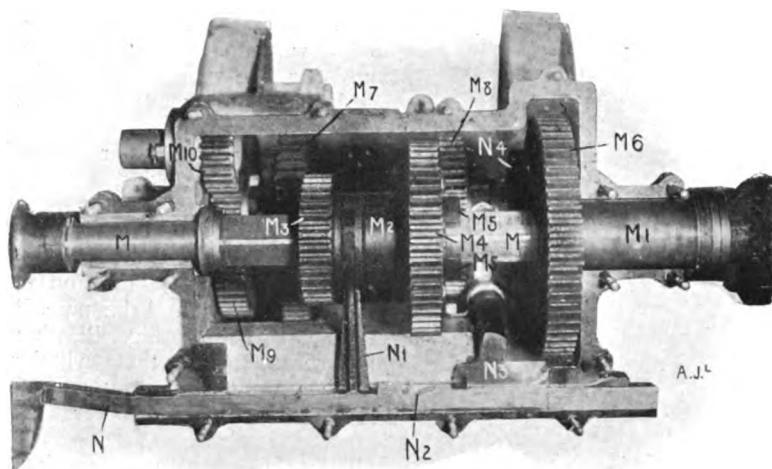


FIG. 7.—The Belsize Change-Speed-Gear. View from the underside of the Gear-Box, with the base casting removed.

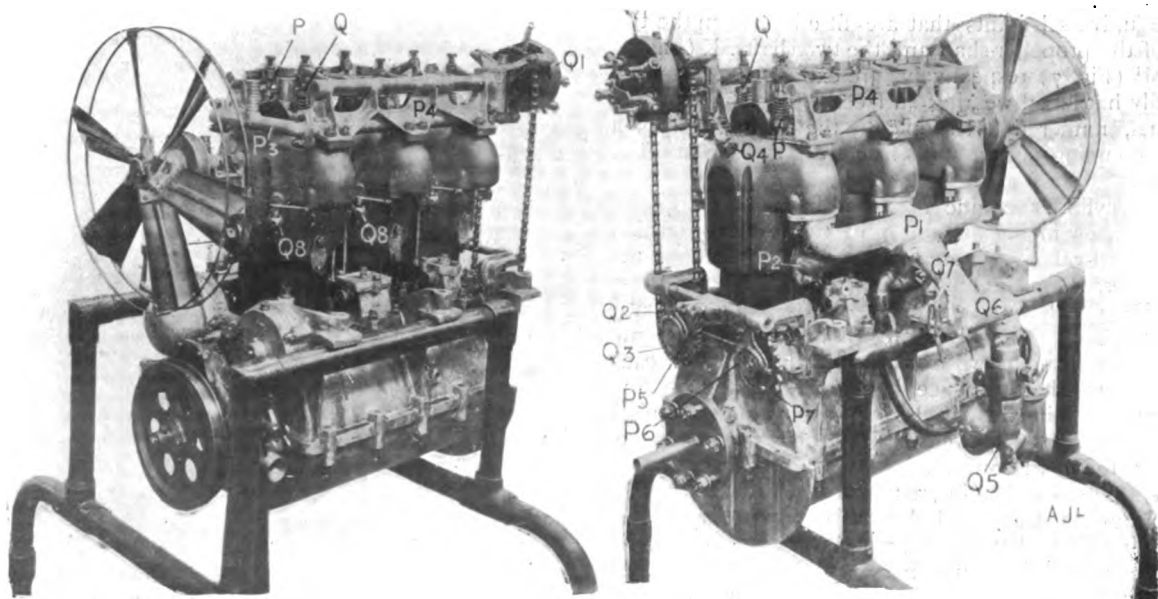
from these bell-crank levers, vertical rods pass upward to the rocking-levers that act direct upon the valve-spindles. The inlet-cams are arranged so that they can be slid longitudinally to give a variable lift to the valves, this action being obtained by means of the small lever, P^5 , and the engaging-fork, P^6 , which are seen in Fig. 9. The exhaust-cam-shaft is fitted with a sprocket-wheel at its rear end, by which the combined commutator and distributor, Q^1 , are driven, this combined mechanism being mounted above the engine in such a way that it projects through the dashboard on the car, and can be seen through a glass window from the seat. The time of ignition is varied by rocking the distributor about the short shaft on which it is mounted. As will be noticed in Fig. 9, there is a small lever, Q^2 , and a fork, Q^3 , arranged in conjunction with the exhaust-cam-shaft in just the same way that the lever, P^5 , and the fork, P^6 , engage with the inlet-cam-shaft. By this means the

exhaust-cam-shaft can be slid longitudinally in its bearings, and the half-compression cams that are carried by it be made to act upon the exhaust-valves during the commencement of the compression strokes, thus rendering it easy to start the engine. The sprocket-wheel, P^7 , on the rear end of the inlet-cam-shaft, drives an oil-pump, which is fixed to the base of the crank-chamber, and circulates the oil through all the bearings.

The combined commutator and distributor, Q^1 , has its insulating base plate formed of marble, and it not only acts as a low-tension commutator for the single-trembler coil that is used, but also as a distributor for switching over the high-tension current to the ignition-plugs, Q^4 .

The carburettor, Q^5 , is of the "Sthenos" type, which has already been described in our columns. Between it and the branched induction-pipe, P^1 , are introduced a hand-controlled throttle-valve, Q^6 , and another throttle-valve, Q^7 , that is controlled by the automatic governor. The governor is merely used to prevent the engine from racing above a certain speed, and the speed is for the most part controlled by the throttle-valve, Q^6 , and by varying the time of ignition, both of which functions are performed from the small hand-levers above the steering-wheel. The variable-lift inlet device is controlled by a small hand-lever that is mounted on the dashboard.

The crank-chamber is formed by two aluminium castings, the horizontal joint between which is in line with the centre of the crank-shaft, but the lower halves of the inner bearings for the crank-shaft are separately bolted to the upper crank-chamber casting, and thus the base can be removed without disturbing the shaft. There are no less than four bearings for the three-throw crank-shaft, for there is one between each of the cranks,



FIGS. 8 AND 9.—Two views of the 18-24-h.p. Belsize Petrol Engine, the former showing the Exhaust-Valve Side, and the latter the Inlet-Valve Side with the Carburettor.

in addition to those at each end of the chamber. The shaft is a solid steel forging of great strength, and the bearing brasses are faced with anti-friction metal, while a proper supply of oil is ensured—both for the main bearings and for those of the cam-shaft—by the oil-pump that draws its supply from the lowest point inside the base.

The cooling water is circulated through a honeycomb radiator that forms the front of the bonnet, and the belt-driven fan that is visible in Figs. 3, 8, and 9 is mounted in front of the engine. It is supported by an adjustable bracket bolted to the front cylinder-casting, and the pulley wheel that drives it is fixed direct to the crank-shaft. Immediately in front of this pulley is fitted the pin to receive the starting-handle, and, in order to facilitate starting, each cylinder is fitted with a half-compression cock, Q⁸, that passes through the wall. The three cocks can be simultaneously operated by a small hand-lever on the dashboard.

In Fig. 10 a view is given showing the regulating levers and pedals, as also the fittings on the dash. It will here be noticed that the dashboard is shaped so as to afford considerable protection to the instruments, as



FIG. 10.—View showing the Regulating Levers and Pedals, together with the Dashboard Fittings on the 18-24-h.p. Belsize Car.

Birmingham Motor Show.—A meeting of the exhibitors was held at Bingley Hall on January 27th. Mr. Cawood, who took the chair, said he had called the exhibitors together for suggestions for improvements in the next year's Exhibition. Thirty-six exhibitors attended, and several suggestions were made for next year's show, including the heating of the building, for lighting the hall better, &c., &c.

Mr. William Priest proposed a vote of thanks to the General Manager, Mr. Cawood, for his enterprise in coming to Birmingham to run a Motor Show.

Considerable support for 1906 was promised by those present, and Mr. Cawood, in replying to the vote of thanks, said that this year's exhibitors would have the first option to book space before the next show was entered upon.

well as to the drivers, that the two foot pedals are of the "push" type, and that—except for the two hand-levers above the steering-wheel—there are no fittings of any kind on the steering pillar. The 18-24 h.p. car has cylinders of 4½-in. bore by 5-in. stroke, while the vehicle, which weighs about 17½ cwt. complete, has a wheel base of 8 ft., and is fitted with 32-in. by 5-in. tyres.

The larger cars are, as we have already said, of practically the same general design throughout, so that in concluding this description of this serviceable make, and all-British type, of car, we need only give the principal dimensions of the 4-cylinder and of the 6-cylinder 30-40-h.p. models. The 4-cylinder vehicle has a wheel-base of 8 ft. 9 in., it weighs about 19 cwt., and the cylinder dimensions of the engine are 4½-in. bore by 5 in. stroke; each cylinder is formed by a separate casting. The 6-cylinder model has cylinders—which are cast in pairs—of 4-in. bore and 4½-in. stroke, while the wheel base is 8 ft. 7 in. (or 10 ft., if for a side entrance body), and the weight is about 20 cwt. Both these powerful vehicles are provided with 34 by 5-in. tyres.

Table of Reference Letters for the "Belsize" Car Illustrations.

<i>Belsize "Junior."</i>	
A Cylinder.	M ⁴ Second-speed wheel on shaft, M.
B Crank-chamber.	M ⁵ Jaw clutches for top speed.
C Flywheel.	M ⁶ Spur-wheel on shaft, M ¹ .
D Exhaust-box.	M ⁷ First-speed wheel on lay-shaft.
E Exhaust-pipe.	M ⁸ Second-speed wheel on lay-shaft.
F Clutch.	M ⁹ "Revers" wheel on ditto.
G Clutch-pedal.	M ¹⁰ Intermediate pinion.
H Gear-box.	N Operating-bar in gear-box.
I Chain to countershaft.	N ¹ Sliding forked arm.
J Sprocket-sleeve on countershaft.	N ² Cam-portion of bar, N.
K Chain to back-axle.	N ³ Cam-plate on rock-shaft.
L Chain-case.	N ⁴ Driving spur-wheel on lay-shaft.
M Brake-pedal.	P Inlet-valves.
N Transverse rock-shafts.	P ¹ Branched induction-pipe.
<i>15-20-h.p. Belsize.</i>	
J Differential axle-shafts.	P ² Water inlet-pipe.
J ¹ Differential-gear.	P ³ Water outlet-pipe.
J ² Bevel-wheel.	P ⁴ Castings supporting valve-gear.
J ³ Back-axle casing.	P ⁵ Lever operating variable inlet-valve-gear.
J ⁴ Roller-bearings.	P ⁶ Forked lever for same.
J ⁵ Ball-thrust-bearing.	P ⁷ Sprocket driving mechanical lubricator.
J ⁶ Internal track band.	Exhaust-valves.
J ⁷ External brake-band.	Q Combined commutator and distributor.
K Short longitudinal shaft.	Q ¹ Timing lever.
K ¹ Universal joint-member on same.	Q ² Engaging fork for timing gear.
K ² Bevel-pinion on same.	Q ³ Ignition plugs.
K ³ End-bearing for same.	Q ⁴ Carburettor.
K ⁴ External ball races.	Q ⁵ Hand-controlled throttle-valve.
L Steering-pillar tube.	Q ⁶ Governor-controlled throttle-valve.
L ¹ Screw-thread on same.	Q ⁸ Half compression cocks.
L ² Feed nut.	
L ³ Toothed segment.	
L ⁴ Lever arm.	
M Driving shaft of change-gear.	
M ¹ Driven shaft of same.	
M ² Sliding sleeve on shaft, M.	
M ³ First-speed wheel on shaft, M.	

THE Great Eastern Railway Company will themselves build the ten new road motor omnibuses which they have determined to place in regular service, starting with the coming season, at their locomotive works. It will be remembered that we some time ago announced they had determined to put these extra vehicles on the road. In the opinion of the directors they will be able to turn out these omnibuses of equal quality to any which they can purchase in the market, whilst at the same time producing them at a lower cost.

THE Dublin Association of Master Owners, who federated some time ago to control the omnibus traffic in the Irish Metropolis, have determined to substitute, as far as possible, motor omnibuses in place of the horse-drawn vehicles.

THE CRYSTAL PALACE SHOW, 1905.

COMPARED with that of last year the present Show, which closes to-day (Saturday), did not appear to advantage, thus bearing out the pessimistic forebodings with which its advent was awaited. In the centre of that enormous main hall are congregated the few stands which this year do duty for an Exhibition; at either end is a large vacant space, where the vacillating purchaser may sit among tropical plants far from the madding crowd and contemplate the "talking points" with which he has doubtless been crammed. For the first time, perhaps, many of the visitors may have realised that the Crystal Palace is not merely a building for automobile exhibits, and that it has many permanent features of interest, such as the statuary, the mural decorations, and the fountain, which this year hold the places hitherto usurped by cars.

Of the Automobile Show itself there is little to say except that its redeeming feature undoubtedly consists in the exhibits of those few first-class firms who are represented by that quality of work which has an inherent interest independent of place, being always an attraction wherever it is on view. As was to be expected, there are but few novelties to record, more particularly in view of the exhaustive analysis which we gave of the recent Paris Salon, nor is it possible, on account of the unrepresentative nature of the exhibits, to compile any generalities about those cars which will principally interest the British public during the coming season. In spite of the relatively few exhibits there is, nevertheless, considerable variety, for they include heavy vehicles, both steam and petrol driven, big touring cars fitted with elegant and roomy bodies, small cars for the "man of moderate means," bicycles of various makes, and three-wheeled vehicles which endeavour to give the sociability of a car at a price which is calculated to tempt the cyclist off his unsociable machine. Besides these, Mr. J. Hargreaves' racing Napier, fitted with a tonneau, graces a stand of its own, and is adorned with a large placard setting forth its history and achievements.

By far the most imposing of the stands, as a whole, is that of the British Automobile and Commercial Syndicate, which is so closely associated with the name of the Earl of Shrewsbury and Talbot. On this stand were numerous cars of different makes, among them being chassis fitted with very fine examples of body work, another feature of attraction being the 40-h.p. Spyker chassis, in which all four wheels are driven. This car, it will be remembered, we mentioned in connection with the Paris Salon. It has a longitudinal propeller-shaft, situated to one side of the engine, which drives the front and rear live axles. Differences in speed between the front and rear wheels are compensated for by a third differential gear in the propeller-shaft itself, while there is a spherical universal joint, situated concentrically with each steering head, in order to allow the front wheels to be driven at all times.

Another chassis of considerable interest is the 17-25-h.p. Hotchkiss, shown by the London and Paris Motor Company, the sole agents for the Hotchkiss Company. This car, which is made by the famous gun factory, has many special features, notably the use of ball bearings for the crank-shaft, a 100-h.p. crank-shaft, similarly fitted, being also shown separately as a model. Ball bearings are also used throughout the transmission. A propeller-shaft drive is employed, the joint in the casing of the differential being horizontal, instead of vertical, in order to enable the upper half of the casing to be removed for inspection. Very neat igniters are employed on the engine, and a simple timing gear is also adopted. A small improvement on this year's model, which is worthy of note, is the arrangement of the lubricating oil tank, which now projects through the dash, so that only the sight-feed is in front of the driver. The greater part of the tank is, therefore, under the bonnet, and a small plunger pump has been fitted up in it, and is worked from a vertical push-rod connected to an eccentric on the cam-shaft. A further convenience resulting from this arrangement is that the tank is filled in front of the dash, and so the chance of spilling oil on the floor-board is obviated.

Several of the more important firms principally confined their exhibits to complete cars, and very fine specimens are to be found on the Germain stand, where Capt. Masui has a magnificent 24-h.p. covered tonneau on view; the Horbick stand where, besides the 15 and 20-h.p. cars, a 3-cylinder 12-h.p. Horbick Minor is also an attraction; the Clement Talbot stand, which is further evidence of Lord Shrewsbury's enterprise; and the Brouhot exhibit which comprise two cars and two chassis of 15 and 20-h.p. on which the prominent features of the Brouhot cars can be inspected. These chain-driven vehicles have several points of special interest, among which must be mentioned their detachable expanding clutch, the spring shock damper, and the very large ignition plugs which are said to outlast the life of the car.

In the exhibits of the Neue Automobil Gesellschaft (N.A.G.) there are many interesting features, the 20-24-h.p. chassis has a 4-cylinder engine with the cylinders cast in pairs, the bore and stroke being 105 mm. and 120 mm. respectively. The mechanically-operated valves are arranged on opposite sides and the ignition is by low-tension magneto. Ball-bearings are employed throughout the transmission, and the engine has a very large internal cone-clutch in which the leather is riveted to the outer member, this being bolted to the flywheel and made in halves, is thus easily detachable. The radiator is also peculiar on this car, for it is composed of numerous small bore tubes arranged vertically in a circular frame which may be withdrawn from its chamber for cleaning purposes. Several complete vehicles are also shown on this stand, including a 12-h.p. touring car, a 12-h.p. lorry, a very neat delivery van, and a taximeter cab. The smaller-powered cars have a similar design of chassis to the larger car, but the change-speed lever is mounted on the steering-pillar. This forms a novel arrangement in view of the fact that the gear is of the Mercedes type and the change-speed lever passes through a vertical slot when changing from one horizontal quadrant to the other.

Another car in which the Mercedes type of gear is operated in an ingenious and unusual manner is the Vinot-Deguingand, also to be seen at the Show. Three exhibits are on this stand, a 20-h.p. tonneau car, a 10-h.p. car, and a 12-h.p. chassis, the two latter being the identical exhibits shown at the Paris Salon. In these vehicles, it will be remembered, the change-speed-lever works in a single quadrant, and is made to engage either sleeve in the gear-box by a vertical bolt connected with a hand catch situated conveniently on it. On the 10 h.p. models three speeds and a reverse are obtained in this way, but on the 20-h.p. cars four speeds and a reverse are provided, the reverse in this case being given by an additional catch which, when released, allows the bolt to fall into a lower position and so connect the change-speed-lever with the "reverse" gear operating rods. Both the engine and the gear-box are carried by a rectangular angle iron underframe which is itself carried by brackets from the main frame. The clutch is self-centering and is easily detachable, being made in halves. It is of the external cone type having a stationary enclosed spring which is attached to the frame in a convenient position for adjustment. The gear wheels are mounted on hexagonal shafts which have a stronger section than a square shaft of the same diameter. Top leaves are fitted to the semi-elliptic side springs in order to deaden their recoil when passing over exceptionally uneven roads.

Although the Show is not conspicuous for new types of cars, yet the Pivot car which now makes its first appearance is an interesting exception. It is of French manufacture, and the sale in this country is in the hands of Mr. P. Cuthbertson, who is showing two finished cars on the Pivot stand. Both these are 24-h.p. models, and one of them is fitted with a tonneau, and the other with a luxurious side entrance Limousine. The chassis have pressed steel frames and are fitted with 4-cylinder engines, with their cylinders cast in pairs and m.o.v. on opposite sides. The engine drives through an external cone-clutch, a gear-box giving four speeds and a reverse, and a propeller-shaft to the live-rear-axle. High-tension magneto ignition is employed, batteries being also provided. The radiator is formed by vertical gilled tubes with natural circulation, and the induced draught of a belt-driven fan is relied upon for the efficient cooling of the water.

Among the exhibits are several small cars, notably the Baby Peugeot, shown by Messrs. Friswell, who also had an excellent show of larger Peugeot vehicles, and Reynold Jackson's well-known "dogcarts." Messrs. H. E. Hall also exhibited a small car called the "Lilliput," which is chiefly remarkable for the employment of a gradually variable gear of the friction disc type. The drive from the countershaft is by a single chain to a live axle which is provided with a very small differential gear. One or two tricars and also several motor bicycles are exhibited in different parts, and among the former class the Otto Bennett Company show the "Avon," which is illustrated and described in another part of this issue. Besides these three-wheeled vehicles, however, this company also show a small four-wheeled car of the same make but having a larger engine under a bonnet in front, a three-speed and reverse gear-box, and a shaft drive. Among the bicycles, attention should be drawn to a curiosity called the Bi-car, which does away with front fork. The rest of the frame is like a "lady's" bike, and as there is a free engine the rider can balance himself on the saddle, with two feet on the ground, before he lets in the clutch to start. The front wheel of this machine gyrates in a kind of cradle and is controlled by a lever mechanism from handle-bars of the ordinary kind.

Several interesting exhibits are to be found in the heavy section, which is, by the way, this year included in the main hall. Among others the exhibits of Messrs. Jesse Ellis, Messrs. Wallis and Stevens, and the Thames Engineering Company attract special notice. The last-named firm are exhibiting a new type of steam lorry, in which the compound engine is placed transversely under the frame, and drives through a propeller-shaft to the live-rear-axle, a two-speed gear being interposed in the usual way. The engine works at 175 lbs. boiler pressure, and has a $3\frac{1}{2}$ in. diameter high-pressure cylinder and a 6 in. diameter low pressure cylinder, the stroke being 6 in., and the normal speed 425 r.p.m. The boiler is of the locomotive type, and is side fired. Semi-elliptic springs are employed, those at the rear having supplementary springs to check excessive play, and the front ends of the front springs are fixed to a transverse rocking beam, which is pivoted at its centre to the frame. Substantial torque and radius rods relieve the rear springs of any driving stress. The load which the lorry has been designed to carry is 4 tons, the speeds being approximately $3\frac{1}{2}$ and $6\frac{1}{2}$ m.p.h.

Besides the steam vehicles, this firm also show a petrol-driven delivery van, capable of carrying loads up to 25 cwt. It has a 12-h.p. twin-cylinder engine in front, a three-speed and reverse gear-box, and a side-chain drive from the differential countershaft to the road wheels. The chain-driven circulating pump is fitted behind the clutch, and very large internal expanding brakes are mounted on the rear wheels.

Not the least interesting part of the Show is to be found in the tyre exhibits, and here the Continental Company and the North

British Rubber Company show their well-known makes. The N.B.R. Company have a very complete exhibit of Clincher tyres and also show the Ducasble Hollow Tyre as well as motor clothing. On the Continental Company's stand is to be noticed a new section, this being a 135 mm. tyre. Users of the very heavy vehicles will welcome this addition to the already long list of sections, for the Continental Company are making a speciality of this particular section, feeling sure that it will supply a want in this direction. The Seddon tubeless tyre—which is already well known to our readers—is also to be seen on Messrs. Moseley's stand. Non-skids are, of course, in evidence, notably the Sampson, shown by Capt. Masui on the Germain stand, the Otto shown on the Otto Bennett Company's stand, and the Sawyer device. All these are of the steel-studded leather tread variety and have now been in use for a long period. A curiosity in this class of thing is the Harborough non-skid band in which the flat-headed rivets project through perforations in the leather tread, which is detachable, and these can be quickly renewed since they are not riveted in any way to the leather. Another novelty is the Lee non-skid which consists of a rubber tread around which a spiral groove is formed.

Accessories and parts are, as usual, well represented, and a good show of steel stampings is to be seen on Messrs. Smith and Sons' stall. Price's Patent Candle Company also have an interesting exhibit, and have several novelties in oils and greases, and also in soaps. Another stall of this nature which is well worth a visit is the Anglo-American Oil Company's stand, where they have on view all kinds of petroleum products.



A PETROL-DRIVEN LANDAULETTE.



A NAPIER LANDAULETTE.—This petrol-driven vehicle is one of the latest productions of the Napier Company, and has been designed to meet the requirements of those who require this type of car, but find the use of electricity inconvenient.

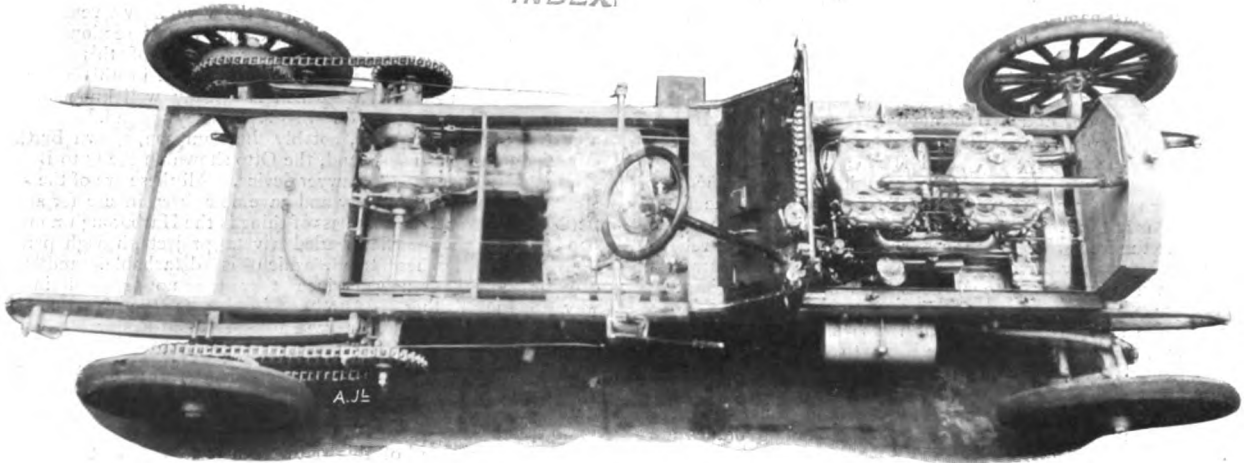
THE elegance and obvious suitability of the landaulette for town use has been the cause of the well-deserved popularity of this class of vehicle. Several people, however, find a petrol-driven car more to their requirements than the electric vehicles hitherto chiefly associated with this type of car, and to meet such demands Messrs. S. F. Edge, Limited, have designed the petrol landaulette seen in the above photograph. The engine is of the standard, four-cylinder, Napier pattern, and is placed under the driver's

seat. The clutch and gear-box are also of the usual type, but in order to get a chain drive the sprockets have been placed inside the frame. The water tank is at the rear, and the petrol tank is on the dash. Accessibility to the engine is obtained through the hinged side louvres, and the front seat also hinges up bodily. We understand that the Electromobile Company have secured the output of these vehicles for a term of years, and that Countess de Grey and the Duke of Sutherland have already placed orders for them.

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THE 70-H.P. MERCEDES CAR.

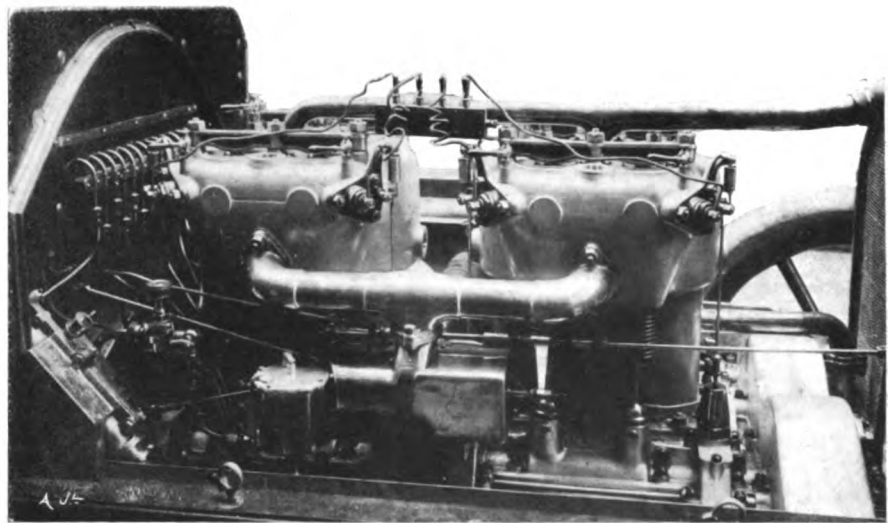
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View of the 70-h.p. Mercedes Chassis from above, showing the relative positions of the Differential-Countershaft and of the Gear-Box, and also giving a good idea of the extraordinary length of the Frame.

ALTHOUGH we have already given a full description, with illustrations, of this new Mercedes model—of which we understand that only five cars are being built at the celebrated Cannstatt Works—yet we think that the accompanying illustrations, which we have ourselves taken, of the first chassis of this kind to arrive in England, will be found interesting. The first view, at any rate, is a useful addition to those that we gave on December 24th last, for it shows the chassis from above, and thus enables its chief novel characteristics to be seen. Our second illustration differs from the corresponding view previously given of the engine (from the right side), in that the inspection plugs are fitted in place above the valves, and that the carburettor has a horizontal type of throttle-valve, instead of the vertical, disc pattern. This chassis will be one of the attractions at the Olympia Ex-

hibition. Our photographs were taken in the premises of the Ariel Motor Company, in Long Acre.



View of the Engine on the 70-h.p. Mercedes Car—as seen from the “off” side—showing the Carburettor fitted with the horizontal type of Throttle-Valve, and the Casing that encloses the Gear-Wheels in front of the Engine.

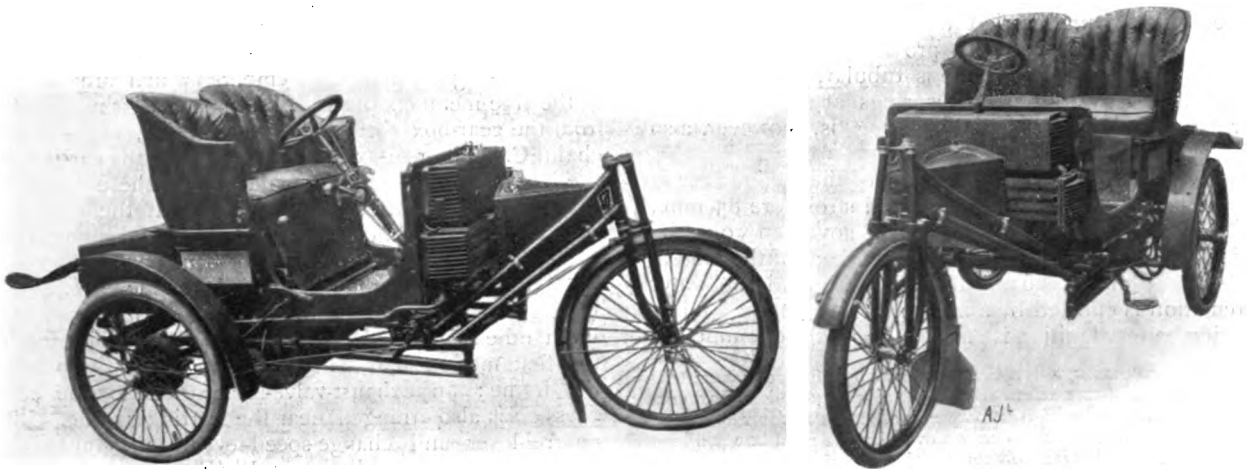
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LORD STANLEY, the Postmaster-General, will be the principal speaker at the opening luncheon at the Olympia Exhibition.

THE Edmonton Board of Guardians some time ago adopted a motor car for the purpose of conveying the local lunatics to the asylum provided for them. This motor car and the cost of its upkeep were recently discussed at a meeting of the Board. It was stated that the car had proved one of the best investments the Board had ever made, for, since its adoption for the purpose to which it has been dedicated, the number of cases of lunacy removed to the asylum had diminished

by 25 per cent. We confess we are unable to grasp the connection between these phenomena. Whether it is the advent of the motor car that instantly restores the prospective inmates of the asylum to sanity, or whether they become sane after the short motor car drive, is one of those things which the report leaves in tantalising uncertainty. Considering that the prospect of a motor car excursion usually induces people to become Parliamentary voters, one might have anticipated that *a priori* it would have conducted to the less general form of lunacy for which asylums are provided. That the opposite is the case will upset the theories of many philosophers.

THE "AVON" THREE-WHEELED CAR.



FIGS. 1 AND 2.—Side and Front View of the "Avon" Car.

SEVERAL attempts have been made to provide a sociable vehicle at a price which shall appeal to a very large public; the majority of these attempts, however, have resulted in the tandem-seat machine now known as the "Tricar." In order, therefore, to give the advantage of the side-by-side seating arrangement enjoyed by cars, and at the same time to reduce the cost of construction as much as possible, the Otto Bennett Motor Company have introduced the little three-wheeled vehicle which we now illustrate. The general appearance of the car is seen in Figs. 1 and 2, which are views from the side and front respectively. In Fig. 3 the manner in which the seats hinge up to allow access to the machinery is shown, while Fig. 4 shows a plan view from beneath, and clearly indicates the general arrangements of the engine and gear.

Fig. 5 shows an enlarged view of the steering-pillar and the change-speed and control-levers which are mounted upon it.

All the machinery is placed under the driver's seat, and the single cylinder engine drives through a three-

speed gear-box—that gives a direct drive on the top gear—and a single chain to the live rear axle. The engine is vertical, and the change-speed-gear is of the sliding spur-wheel type, both engine and gear-box being set transversely across the frame. Free-wheel clutches are employed instead of a differential, and as no reverse gear is provided, it has not been necessary to provide means for locking them solid. All the tanks are carried

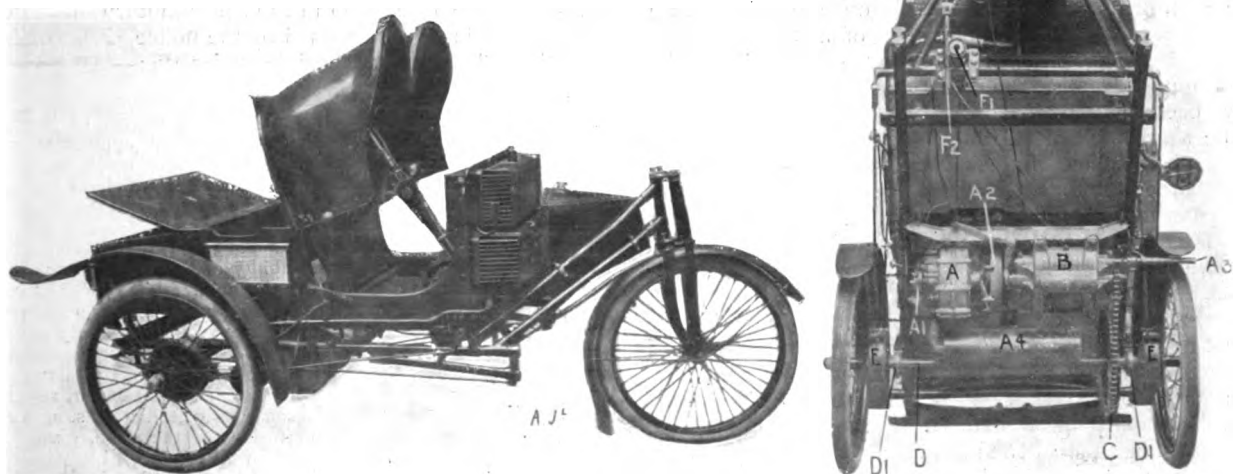


FIG. 3.—The "Avon" Three-Wheeled Car.—View showing the manner in which the seats hinge up to give access to the machinery.

FIG. 4.—The "Avon" Three-Wheeled Car.—View from the underside.

forward, the petrol tank being fitted into the frame just behind the steering head, the water tank and radiator being in front of the dash, and the lubricating tank and battery box being carried behind the dash. In this way there has been room to provide a large tool box behind the seats. The frame is tubular, and the body is supported by four helical springs at each of its four corners; a transverse elliptic spring is, however, also employed at the rear.

Referring to Fig. 4, the position of the engine is seen by the crank case, A; both bore and stroke are 85 mm., and is rated at $4\frac{1}{2}$ -h.p. It is governed on the throttle by a centrifugal governor worked off the clutch. The valves are mechanically operated, and the water circulation is effected by a friction-driven pump. High-tension battery-ignition is employed, and the commutator,

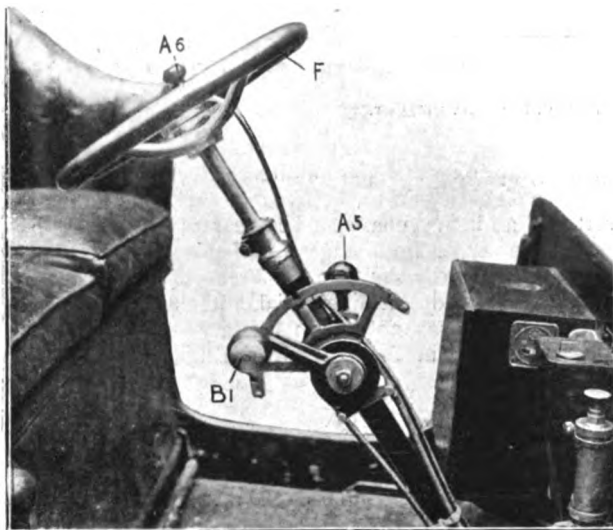


FIG. 5.—The "Avon" Three-Wheeled Car.—View showing the Steering Wheel, the Change-Speed-Lever, and the Control-Levers acting on the Ignition and Throttle.



London and Motor Omnibuses.—One by one the omnibus companies in London are falling into line in respect to the employment of motor omnibuses in different districts of the Metropolis. Now the enormous advantages of this method of locomotion have been realised, it looks very much as if there were to be a scramble as to which company will be in first with a big service of mechanically-driven vehicles. The Associated Omnibus Company are amongst those who are entering the arena, and the directors, in their report just issued, state that after carefully watching the trials of various kinds of motor omnibuses, although they consider they are not yet perfect, they think they are so far advanced that the Board now deem it time to give them a fair trial, and with that view they have taken steps to place some on the road during the current year. It seems strange that London, the greatest city in the world, should have had to wait so long before experiencing the benefits which the adoption of mechanical traction will undoubtedly confer. Many towns throughout the country have for a considerable time been more favoured than the Metropolis. Referring to this subject upon the occasion, last

A¹, is brought to a convenient position at the side of the frame. The flywheel is inside the crank-case, so that only the clutch, A², which is of the internal cone pattern, is interposed between the engine and the gear-box, B. Both the engine and gear-box are carried by transverse-angle iron cross-members, which are clipped to the side members of the main-frame. Passing directly from the gear-box to the live-rear-axle, D, is the single chain, C. The rear-axle, D, is solid, and is carried by the bearings, D¹, from the main-frame; these bearings are carried by slotted brackets, so that the chain is adjustable. Two brake-bands, E, act on each drum at either end of the axle, one pair of bands being operated by a foot-pedal, and the other pair by a side-lever.

The engine is started through the gear-box, the starting-handle being made to engage with a projection of the first motion-shaft, which is brought to the side of the frame; an exhaust-valve-lifter to ease the compression is also arranged near the starting handle. The control-lever and change-speed-lever are mounted on the steering column, the latter, B¹ (Fig. 5), working in a vertical quadrant, and operating the fork in the gear-box by means of Bowden wires. Bowden wires are also employed in connection with the throttle-lever, A⁶, and the timing-lever, A⁵. The throttle-lever, A⁶, is mounted above the steering wheel, F, while the timing-lever, A⁵, is fitted to the steering column on the opposite side to the change-speed-lever. The lower end of the steering column is fitted with a pinion, F¹ (Fig. 4), which engages with the rack, F², connected, through the rod F³, with the steering head. In other models, helical springs, not shown in the above photographs, are introduced above the front forks.

Table of Reference Letters for the Avon Three-wheeled Car.

A Engine crank-case.	C Chain.
A ¹ Commutator.	D Axle.
A ² Clutch.	D ¹ Bearings for axle.
A ³ Starting handle.	E Brakes.
A ⁴ Exhaust-box.	F Steering wheel.
A ⁵ Ignition lever.	F ¹ Pinion on steering column.
A ⁶ Throttle-lever.	F ² Rack engaging with F ¹ .
B Gear-box.	F ³ Rod connected to F ² .
B ¹ Change-speed-lever.	



October, when Messrs. Tilling invited members of the Press to take a trial trip in their new motor omnibuses, which had just been passed by the police, *The Builder* had the following very sensible leaderette:—

"LAST week the 'trial' run of a new motor omnibus was heralded throughout the daily Press with a degree of innocent enthusiasm almost equal to that which might appropriately be excited by the practical consummation of some great and novel invention. What the public were expected to believe was 'an interesting experiment to test the capabilities of motor omnibuses' was merely the demonstration in our backward metropolis of a fact thoroughly recognised in large provincial cities like Birmingham, where the advantage and practicability of the motor omnibus are perfectly familiar to all who use the public streets. The 'trial' was no trial, and the 'experiment' no experiment. To foreigners who visit our capital its sluggish conservatism in many respects must convey a very unflattering picture of national enterprise, while to provincials the same characteristic is a perfect laughing-stock. But in addition to the plethoric habit of London, regarded as an entity, we fear there is some hazy feeling of superiority, perhaps due to the enormous dimensions of the place, giving rise to the idea that things successful in little towns, like Glasgow, Liverpool, Manchester, and Birmingham, might break down under the responsibility and excitement attending their introduction to so important a city as the capital of the British Empire. However this may be, we are glad to learn that the day of the antiquated horse-drawn omnibuses is at last approaching its inevitable end."

THE NAPIER CLUTCH.

THE increasing use of metal-to-metal clutches, and the general absence of cone clutches in this category, renders that employed on the Napier cars of particular interest. It is very generally recognised that there are considerable difficulties in the way of manufacturing a satisfactory metal-to-metal cone-clutch, the chief of these being the selection of suitable materials and of a proper angle for the engaging members, to ensure that the clutch shall neither be "fierce" nor liable to slip under its normal load. That a successful and reliable clutch of this nature can be obtained by careful experiment and design is shown by the fact that the Napier cars have been fitted with them for some time past.

By means of the accompanying photographs, which we have received from S. F. Edge, Limited, we are now able to give our readers some particulars of this interesting clutch. Four views are shown—(1) in which the clutch is complete; (2) in which the inner and outer members are seen separately; (3) in which the internal member only is seen, from the front; and (4) another view of the internal member showing the clutch spring.

The clutch itself is of the internal cone type, and the pressure of the clutch spring is entirely self-contained when the clutch is engaged, so that no end thrust is put upon the shafts. Referring to the illustration, the internal member, A, which is of aluminium, has a cast-iron facing, A¹, riveted to it, forming one friction surface. The aluminium body, A, of this member is, it will be noticed, dished considerably, so as to accommodate the clutch spring, C, which presses against it, at one end, and against a flange, B¹, at the other end, a ball-thrust bearing, C¹, being interposed between the spring, C, and

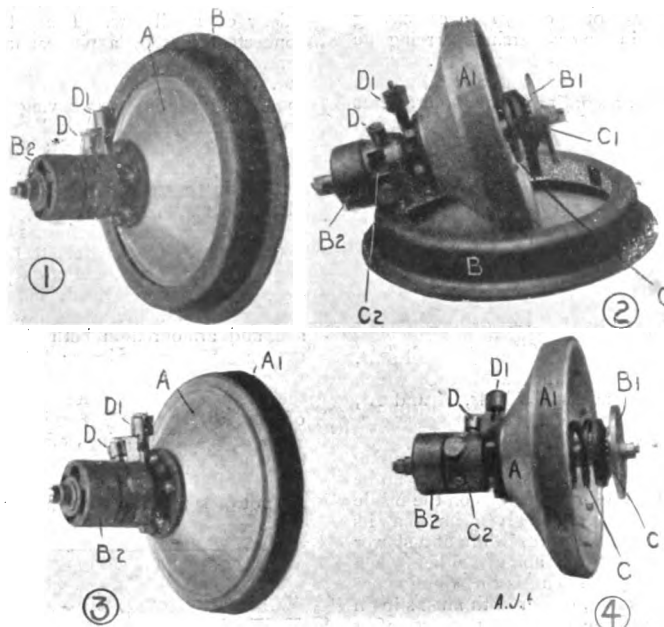
the flange, B¹. The flange, B¹, is bolted to the flywheel of the engine so that the shaft upon which the inner member, A, is freely mounted, virtually forms part of the crank-shaft, and thus ensures proper alignment of the parts. Also bolted to the flywheel, is the cast-iron ring, B, forming the outer member of the clutch. This outer member, B, encircles the internal member, A, so that the pressure of the spring, C, acting between them, forces

out the member, A, and so causes the two friction surfaces of the clutch to come into contact. In order to ensure the proper lubrication of the surfaces, grooves are cut at intervals across the outer member; in these grooves, the oil remains while the clutch is engaged and the oil thus retained is always in readiness to lubricate the surfaces directly the clutch is allowed to slip.

In order to disengage the clutch, a fork, which is not shown in the illustration, but is connected with the boss, C², that it thrusts forward, causes the member, A, to move inwards against the action of the spring, C. In order to allow the relative motion between the inner member of the clutch, and the shaft on which it is carried, to take place—with as little friction as possible—when the clutch is disengaged, a ball thrust bearing, C¹, is fitted between the

spring, C, and the flange, B¹, and in this way the spring is also relieved of all torsional strain.

A universal joint is enclosed in the box, B², and this ensures flexibility between the clutch-shaft and the gear-shaft; and the spigot bearing between these shafts is lubricated from the oil-cup, D. Another oil-cup, D¹, is provided for lubricating the bearing surface of the member, A, on the extension of the counter-shaft.



THE NAPIER CLUTCH.—Four views of the Napier metal-to-metal clutch showing (1) the clutch complete; (2) the inner and outer members separately; (3) the inner member from the front and (4) another view of the same part showing the clutch spring.

Reference letters:—A, aluminium internal member, A¹, cast-iron friction surface riveted to A; B, external member; B¹, flange on clutch shaft; B², universal joint; C, clutch spring; C¹, ball thrust bearing for C; C², boss to which clutch fork is connected; D, lubricator for spigot bearing; D¹, lubricator for clutch shaft.

Cabmen and Motor Cabs.—There were searchings of heart at the Crown, Clerkenwell Green, one night last week, when a number of cabdrivers met and bemoaned the manner in which the future of their business is being threatened by the expected advent of the motor cab. On the whole the cabmen were pessimistic, and one speaker advocated a method of combating motors which has already been tried and found wanting, viz., to refuse to get out of their way. A more sensible speaker argued that motor cabs were bound to come in the near future, and that the cabmen of to-day had better learn to drive them. But this counsel did not at all raise the spirits of the

meeting. There is nothing that the average citizen of the cabman's status dislikes so much as having to learn something new, even though the Cab-drivers' Union is arranging to provide cheap instruction. There are, it appears, some 1,200 cab-drivers in London, and it will be a serious matter if they are all to be gradually thrown out of employment. We think they would be wiser to bow to the inevitable and learn automobile driving. This, at any rate, is the view of the Cabmen's Union. The Union is having a motor chassis fitted up purposely for instruction, and will soon be in a position to provide tuition to those who wish for it.

PETROL MOTOR CARS*—(conclusion).

By FRANK LITTLE, A.M.I.E.E.

Hele-Shaw Clutch.—To allow for this slip a clutch has recently been devised by Prof. Hele-Shaw, Fig. 3, D, and consists of a series of plates alternately attached to the pair of shafts, each plate being formed into the frustum of a cone having a sharp angle. These plates are well lubricated and are held into contact by a spring. Provision is made for cooling, and it is claimed that this clutch may be allowed to slip continuously without injury to the rubbing surfaces.

Differential Gear.—The differential gear appears to mystify most people, and is one of the least generally understood parts of the power-transmitting mechanism of a motor car. In a car having side chain-drive this gear is situated in the countershaft carrying the sprockets. In a gear-driven car it is usually located at the centre of the live-back-axle. Its object is to vary automatically each driving wheel's relation to the other, according to the requirements of the moment. The car never proceeds far in a straight line, but

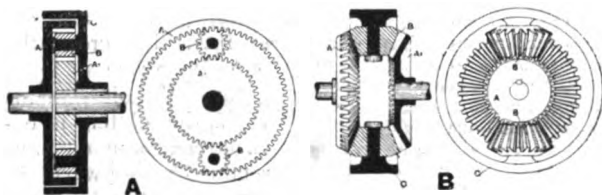


FIG. 4.—Two Forms of Differential.—A, Spur Wheel; B, Bevel Wheel. The power is transmitted to the member C, which carries the Pinions, B, engaging with the two Wheels, A and A', which are driven by them.

is, either owing to turns in the road or the necessity for avoiding traffic, constantly describing a series of curves. Now it can be easily seen that the wheel, which for the time being is on the inside of the curve, has a shorter distance to travel in a given time than its fellow on the outside, and consequently requires to run at a slower speed, or, like the man at the inner end of a rank of soldiers when wheeling, to "mark time." Where both wheels are rigidly connected and unable to turn independently, one or both must slip on the road surface, to the destruction of the tyres and the discomfort of the passengers.

Crypto Differential.—The differential gearing of the earlier type is known in the motor world as the crypto (Fig. 4, A). It consists essentially of a ring or drum on which are mounted two or more pinions which mesh with wheels carried upon the inner ends of the two shafts which it is desired to balance, the power being applied to the drum by any suitable means.

Bevel Wheel Differential.—Fig. 4, B, shows two views of a balance gear composed of bevel wheels.

Fig. 5 shows diagrammatically the action of the differential. The two wheels, A and A', of Fig. 4, have been straightened out to form racks. Now suppose that both racks, A and A' (Fig. 5), are free to move in either direction, the power to be applied to the pin on which the pinion is mounted, in the direction of the arrow, X, both racks will move forward in the same direction, and so long as the load on each rack is the same they will maintain their relative positions with regard to each other. Now imagine one of the racks to be fixed or retarded by means of a brake, then the pinion must roll along it, and in doing so push the free rack forward. In the case of a balance gear fitted to a car, the retarding effect is produced, of course, by the friction of the tyres upon the road.

Ackermann System—Control and Steering.—The steering of motor cars is usually on the Ackermann system. Fig. 6 shows a diagram of the system. A B is the front axle of the car, and at A and B short angles, A C and B D, on which the wheels revolve, are pivoted. These axles have arms, A F and B E, rigidly forged with them, or otherwise attached, and at such an angle that if A F and B E be produced they will meet in a common point in the centre of the rear axle. The extremities of these arms, F and E, are connected by a rigid rod, F E, so that the distance between F and E is at all times constant. Motion is produced either by a lever pivoted at some point, S, on the angle, and engaging with the distance rod, F E, at some point, G, or by a second arm, such as B P, attached to one of the short steering axles, which is operated by a second distance rod. This last is the method usually employed on anything but the lightest cars. Sometimes the polygon, A F E B, is made outside the axle instead of behind (Panhard system). The arm, S G, has been replaced by a V-shaped one having two pivots at the end of the V, and many other attempts have been made to

construct a link motion between the axles that will give more correct results than that illustrated, but so far the result has been small in comparison with the extra complication and expense involved.

Steering Pivots.—An important point in the design of a steering-gear is the way in which the steering-axes are pivoted to the front axle of the car. Fig. 7 shows three types: (A) is the type usually employed on heavy cars. The axle has a head forged on it, bored out vertically with a slight taper. The steering-pivot takes the form of a vertical pin of corresponding taper, and fits the bore, the weight being taken either by a ball bearing or by a set pin in the crown of the axle. This method is good and safe for heavy cars, since it provides an ample bearing surface for the pivot, and nothing short of the fracture of an axle will disarrange it. Fig. 7, B, is used chiefly on small cars. The axle is forked, and the steering-pivot connected to it by a pin passing through both the steering axle's centre and the arms of the fork locked at the bottom by a pinned nut. This method is also very good for light weights, but there are some modifications of it having the ball cones top and bottom, and no pin, that are distinctly risky practices.

The third method (Fig. 7 C) is that employed on the Mercedes cars, and in this case it is the steering-head that is forked, and the fixed axle that forms the centre of the hinge. A pin passes completely through the pair.

Chassis Frames.—The frames are built up in a number of ways.

(a) Lengths of channel steel, [I-shaped section, united at the angles of their ends, and cross pieces with strong angle pieces or braces; (b) as described, but filled internally with ash, which greatly increases the strength with very little weight; (c) built of ash, and armoured on both sides with steel flitches with channel steel arms or cross pieces; (d) tubing frames screwed into joints, which also make joint with cross pieces and stays; (e) and lastly, the one-piece pressed steel frame, perhaps the strongest and lightest of them all.

Springs.—The springs of a motor car vary very much with the different makers. Fig. 8 shows three types. Those designed to run on solid tyres should have specially designed springs; if they are not of sufficient strength they are liable to breakage due to the

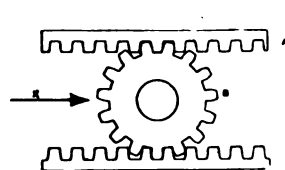


FIG. 5.—Diagram illustrating the action of the Differential Gear.

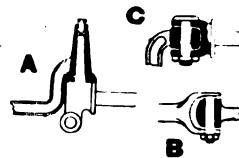


FIG. 7.—Three types of steering heads. A, Pivot; B, Forked Axle; C, Forked Steering Head.

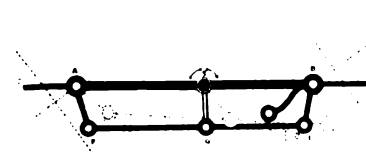


FIG. 6.—Diagram of the Ackermann Steering Gear.



FIG. 8.—Three Forms of Leaf Springs.—A, Full Elliptic; B, Semi-Elliptic with Shackles each end; C, Semi-Elliptic hinged to a Spring Hanger.

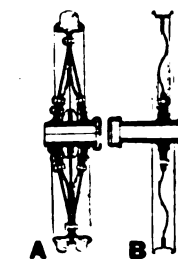


FIG. 9.—Two types of pressed steel wheels. A, built-up double plate-wheel for heavy work; B, stamped corrugated sheet wheel for light work.

additional road shocks. Cars can be made, and are being made, to run on solid tyres with comfort, and I feel confident that such cars will be the means of making motoring both practical and economical.

Springs for Solid-tyred Cars.—It is useless simply buying a standard pattern car and fitting solid tyres to it. Makers of pneumatic tyred cars have counted too much on the tyres for shock-absorbing power, consequently they are much under-sprung. The springs should be designed to swallow and conceal the inequalities of the road, and should rapidly absorb the work done on them while moving rapidly under the force applied to bend them. They should

* Excerpt of a paper read before the N.E.C. Inst. Engineers and Shipbuilders at Newcastle-on-Tyne, January 20th, 1905.

not oscillate much after each road "bump" has passed, and should be deflected through half their working distance when fully loaded. Springs are being made much longer now, which is a distinct improvement. The frame of the car should be slightly higher at the back from the road than the front end, so that when fully loaded the frame should be parallel with the ground.

Wheels.—For small light cars wire wheels are quite as strong as, if not stronger than, artillery wheels. For heavy cars the latter are preferable because of their combined strength and resilience. All the wheels should be of the same size, because the same tyre will

then fit any wheel. Light pattern pressed steel disc wheels for solid rubber tyres (Fig. 9), are being used for motor omnibuses, delivery vans, light motor wagons up to 2 or 3 tons carrying capacity, and heavy touring cars. They are recommended for their strength, lightness, and durability.

The embossed steel disc wheel, as shown in Fig. 9, B, is coming into use for light motor passenger vehicles. Owing to their construction they give considerable lateral strength together with a minimum weight, and their chief advantage over the artillery wheel is durability, shrinking being quite impossible.



CORRESPONDENCE.

. *The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.*

DELHI-BOMBAY TRIALS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—We have received by the last mail from India several communications dealing with the recent Delhi-Bombay Trials, and enclose some extracts herewith, from which it will be noted that a great deal of dissatisfaction has been caused by the judges' awards, and a protest signed by the majority of competitors has been made to the Western Union. Fortunately this dissatisfaction has found public expression in the Indian Press, and those cars which were conspicuous for good performances have thus received in some measure their due rewards. At the same time it cannot be too strongly urged on the promoters of these competitions that the bare suggestion of prejudice in the matter of awards will effectually prevent the possibility of holding future trials.

One of our friends who took an active part in the run writes us from Bombay: "When the judges' decision and awards were published there was the most intense irritation and indignation. I had a consultation with Mr. ——— and Mr. ———, and told them straight to refuse the consolation prize offered them. They acted on my advice, and I feel sure your company would not be pleased to have one of their cars given a consolation prize when it had run nearly 1,000 miles under the most strenuous conditions, and come in without loss of any marks. Some particulars as to the team running of the three Wolseleys may interest you.

Mr. Vakil's	...	...	8 non-stops.
Capt. Muter's	...	...	4 " "
Lieut. Skelton's	...	...	5 " "

17 " " out of a possible 24.

A far higher average than any other team obtained. Now, please bear in mind that in England you have never had trials like these,

over all sorts and conditions of roads—good, bad, and very bad. The test was most severe, as is shown by the fact that only 20 cars out of 38 finished at all."

The owner of the Wolseley car which made the 8 non-stop runs sends a number of Press cuttings expressing in very high terms the qualities of the car and the manner in which it performed the journey. Another letter says "there is unanimity of opinion that we have been hardly dealt with by the judges," the judges having awarded us a consolation prize which we did not deserve.

We think that the foregoing extracts are sufficient to prove that the officials responsible for the awards in these trials were not selected with a due regard to their knowledge in motor matters, and we think you will agree that this is to be very much regretted, especially in view of the excellent arrangements which appear to have been made for the conduct of the trials.

Yours faithfully,

THE WOLSELEY TOOL AND MOTOR CAR COMPANY, LIMITED.
January 27th.

THE WYE AND MOTOR-BOATING.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—In your issue of the 21st I notice a paragraph on the Wye as a river for motor-boating. I know the Wye well and lived for some years in the district, and I think a word of warning would be useful. The Wye is a very dangerous river because of its heavy tides and its dangerous shoals, and also from the steep banks of very deep soft mud, which make escape difficult even for a swimmer. Many fatal accidents have been recorded, and anyone proposing to boat on this river would be wise to take expert local advice.

I am, Sir,

Your obedient servant,

January 26th.

RUSSELL.

[Our paragraph stated that among the "disadvantages" were "the very violent tides" and "higher-up many rocks and shoals."—ED.]



Not so very long ago, it was considered quite phenomenal if, within three or four days of the opening of an Exhibition, the majority of the stands were completely finished and all their attractions perfectly staged for the inspection of visitors. Thanks to the prompting of those who have of recent years been responsible for the organisation of Exhibitions in connection with the trade, and the energy displayed by the exhibitors themselves, this is happily a reflection which cannot be now applied to Automobile Exhibitions. Most firms are sufficiently satisfied with the erection of their stand by the day before the opening. Messrs. Charles Jarrott and Letts, however, have gone considerably further, and by the end of last week had the whole of their stand actually fixed in place ready for the opening at Olympia on February 10th. We fancy this is a record, and we reproduce a photograph showing the stand actually in position.

CLUB AND ASSOCIATION DOINGS.

The Automobile Mutual Protection Association.—A meeting of the Council of the Association took place last week, when the chair was occupied by the President, the Earl of Shrewsbury and Talbot. It was formally reported that the commercial vehicle section of the Agricultural Hall Motor Car Exhibition would receive the official support of the Motor Van and Wagon Users' Association, which body had also appointed a jury of experts to make awards for novel features in design. The fourth annual general meeting of the Association was fixed to be held during the same show.

The following firms were admitted members of the Association:—Messrs. H. E. Hall and Co. (Tonbridge); the Cowey Engineering Company, Limited (Kew Gardens); Messrs. Lewis (Liverpool, Birmingham and Manchester); Messrs. Dean and Burden Brothers, Limited (Salisbury); the Shrewsbury and Challiner Tyre Company, Limited (Manchester); Messrs. Scammell and Nephew (Spitalfields); Messrs. John Stewart and Son, Limited (Poplar); Messrs. H. M. Hobson, Limited (Chelsea); Messrs. Jacobs and Barringer (London); and the Glasgow Motor Lorry Company, Limited (Glasgow).

Blackheath Automobile Club.—Nearly 180 members and friends were present at the first annual dance of the club at the Concert Hall, Blackheath, on Saturday last. So successful was the function voted that the Committee hope to arrange for a series next winter in place of one only. A large increase to the ranks of membership is anticipated this year, and local motorists who propose joining should forward their names at an early date to the Hon. Sec., Mr. Alfred Roberts, of "Madgelands," Beaconsfield Road, Blackheath, S.E.

Leicestershire A.C.—On Monday evening, the 30th ult., this club held their annual dinner at the Bell Hotel, Leicester. Mr. E. George Mawbey, M.I.C.E., presided, and some fifty members and friends attended. After the loyal toasts, Col. L. L. Powell, J.P., proposed the "Leicester Corporation and the Leicester County Council." Mr. E. Manville, M.I.E.E., gave the toast of "The Leicester A.C. and President," and Mr. J. A. Corah, J.P., proposed the "A.C.G.B.I. and the Motor Union," while the "Kindred Clubs and Visitors" and "The Officers of the Club" concluded the toast list.

At the General Meeting previous to the dinner, the following officers were elected for the ensuing year:—President, Mr. E. George Mawbey, M.I.C.E.; Vice-Presidents, Col. Lionel Powell, J.P., Mr. J. A. Corah, J.P.; Committee, Messrs. W. Earp, H. A. Hamshaw, L. H. Hargrave, V. Oliver, H. H. Wildt, T. C. King, R. Sutton Clifford, Jun., A. H. Faulkner; Hon. Treasurer, Mr. H. R. Harding; Hon. Secretary, Mr. A. McAlpin.

Manchester Automobile Club.—The annual general meeting of the club took place last week at the Midland Hotel, Manchester, when Mr. J. Hoyle Smith, the hon. secretary, submitted his report, which showed that the club now numbers just under 200 members. Dealing with the work of the club during the year it was pointed out that protests had been made to the Local Government Board against granting a 10-mile limit in various important towns. Correspondence and representations had been made to the Cheshire and Lancashire County Councils in respect to their by-laws on the lighting of vehicles at night, in order to procure alteration in them more in keeping with the present use of the roads. The club committee had tried experiments in connection with the dust nuisance, and had, in conjunction with the local councils, treated 1½ miles of road in Cheadle and another strip in Withington with West-rumite. In addition, they had made a donation towards treating other roads in a similar manner, and the results were sufficiently encouraging to warrant local authorities in suburban districts in experimenting further.

The financial side of the club was treated in the report of the hon. treasurer, Mr. S. Okell, and was found to be in a thoroughly satisfactory state.

Mr. Frederick Smith, who for the past two years has occupied the chair, proposed that Mr. T. W. Grace should act as president for 1905, which was unanimously assented to. Mr. F. Smith was elected a vice-president, as was also Mr. S. Okell, who had to give up his treasurership owing to his intention to go abroad. The rest of the officers and the committee elected were as follows:—

Honorary Treasurer: Mr. F. R. Hesse; *Honorary Secretary:* Mr. J. Hoyle Smith; *Committee:* Messrs. T. W. Grace, F. R. Hesse, G. Higginbotham, A. E. Jones, N. Kilvert, H. W. Lee, J. A. Morris, D. Moseley, V. F. O'Neill, L. G. Schwabe, F. Smith, J. Whitehead.

The new president, Mr. Grace, announced the intention of the committee to approach the Lancashire and Cheshire County

Councils with the object of inducing them to come to an arrangement with them to place notice boards at sharp corners and dangerous places in the district. In doing this he pointed out that it was to the interests of motorists to reduce the liability to accident. As public opinion stood at present, however little motorists might be to blame the probability was that they would be held accountable for any accidents occurring.

It was also determined to form a sub-committee for the purpose of arranging for hill climbing contests, gymkhanas, etc., during the coming season.

The annual dinner, as already announced, will take place on Wednesday next, February 8th, at the Midland Hotel at 7 p.m.

Nottinghamshire A.C.—On Thursday of last week the fifth annual meeting of this club was held at the Black Boy Hotel, Nottingham. Mr. C. Hardy, the president, occupied the chair, and there were present:—Messrs. G. H. Kirk, E. W. Wells, G. Cowen (vice-presidents), H. Belcher, B. W. Winter, J. C. Wilson, S. Harvey, R. Cripps, B. Granger, H. Daubney, H. Rimington, A. Watts, H. V. Stevens, R. R. Latham, A. Osborne, P. Huskinson, J. C. Bennet, J. W. Adams, W. D. Wells, E. H. Joule, H. Bircumshaw, R. Harbidge, M. R. Browne, and the hon. sec. (Mr. A. R. Atkey).

The secretary's annual report was submitted, and in this it was stated that another challenge cup had been offered by Mr. Wilson for this year. The first lady member, it was mentioned, during the past year, was Miss Starkey, of Southwell, since whose accession another lady had joined.

The report dealt with the legal actions which had been successfully carried through by the club, and also recorded the placing of a sign board by the club at each end of the village of East Stoke, on the way to Newark, in regard to cautious driving, which had given satisfaction to those at whose representations the boards had been put in place. The financial statement was of a satisfactory nature, and showed a substantial balance in hand.

Mr. Charles Hardy was re-elected president of the club, and the three vice-presidents—Messrs. E. W. Wells, G. H. Kirk, and G. Cowen—were also reappointed, with the addition of Mr. A. R. Atkey, who retired from the position of hon. secretary after several years of valuable services to the club. The vacant post, which also includes the duties of hon. treasurer, was filled by the election of Mr. B. Granger. Voting for the election of 10 committeemen resulted in the appointment of Messrs. R. Harbidge, H. Belcher, R. Cripps, S. Harvey, B. W. Winter, W. D. Wells, M. R. Browne, D. Foster, W. Foster, and H. Rimington. Messrs. C. Hardy, A. R. Atkey, and B. Granger were selected to represent the club on the Motor Union in London, and Messrs. Stevens and H. Bircumshaw were appointed auditors.

Sussex Automobile Club.—A large and influential gathering of Sussex automobilists took place at the Old Ship Hotel, Brighton, on Saturday last, with the object of forming a county automobile club. The meeting had been convened by the Motor Union, and Colonel Holden, the President of the Union and Chairman of the A.C.G.B.I., occupied the chair at the commencement, and in a few explanatory words set forth the objects of the meeting. He said promises of support and membership had been received from all quarters of the county, and already the proposed club was an assured success.

Colonel Holden having vacated the chair, Mr. W. James, of West Dean Park, Chichester, was unanimously selected as chairman of the meeting.

Mr. Rees Jeffreys, the Secretary of the Motor Union, stated that over 70 promises of membership had been received beforehand, and 20 more since the meeting had opened.

Earl Russell moved a formal resolution that the club be formed, which was carried unanimously, and the following committee, with power to prepare and adopt a set of rules, were then duly appointed:—Messrs. J. Amps (Uckfield), B. Y. Bevan (Brighton), C. E. Collins (East Grinstead), J. P. Cockerell, J.P. (Eastbourne), Sir James Duke (Laughton), Messrs. A. Scrase Dickens (Horsham), H. S. W. Eyre (St. Leonards), C. F. Frowd (Hastings), Sidney Farrer (Brighton), Captain J. G. R. Homfray (Hove), W. James, J.P. (Chichester), J. Godwin King (East Grinstead), Captain F. D. Lyon (Brighton), Boyle Lawrence (Bognor), C. J. Lucas, J.P. (Warnham Court, Horsham), E. G. Miller (Brighton), M. F. Mievill (Chichester), G. W. Osborn, J.P. (Heathfield), Major Pierson, J.P. (Worthing), Earl Russell (Chichester), Captain Gerald Spencer (Ringmer), Mr. A. M. Singer (Hove), Major R. C. Turner (Brighton), and Mr. W. L. Wallis (Eastbourne).

Affiliation, it was announced, would be applied for with the A.C.G.B.I., and the subscription was fixed at two guineas, with the proviso that an entrance fee was to be charged for all joining after May 1st. The idea of forming the club was to have Brighton as the working centre, with sub-centres all over the county. Mr. Scrase Dickins, of Horsham, has undertaken the duties of honorary secretary, and, as a result of the meeting, a very successful future should be in store for this, the latest formed automobile club in Great Britain.

Yorkshire A.C.—The annual meeting took place last week at the Great Northern Hotel, Leeds, under the presidency of Mr. E. H. Hepper.

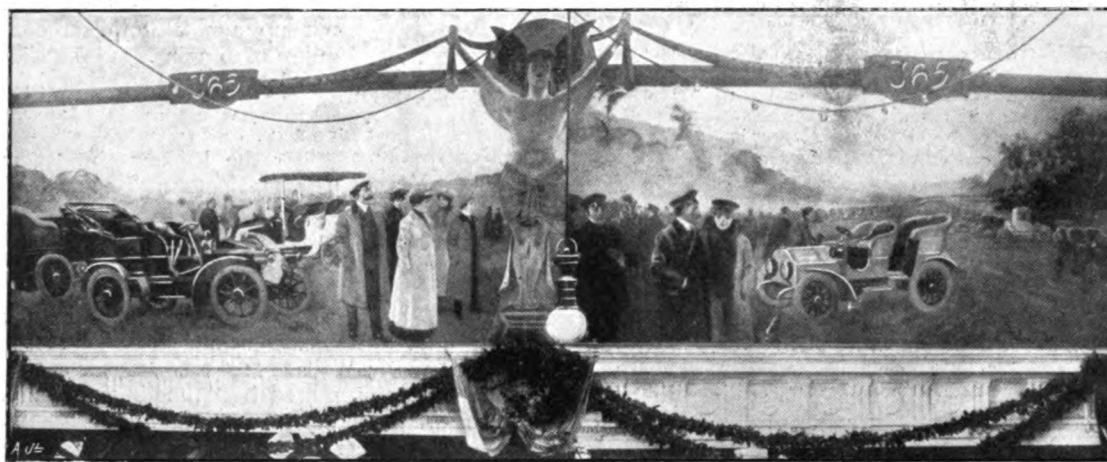
Mr. Hepper said it was intended that the competition for the trophy promised by Mr. Leng, of Sheffield, should be decided on the Filey sands. There was to be another hill-climbing contest at Pot Bank, near Harrogate, or some other hill, and, if Earl Fitz-

william gave his permission, a speed trial was to take place at Wentworth Woodhouse.

Mr. Jones suggested that more interest might be taken in the social side, and lectures might be held on technical matters; he also suggested that they should hold a camp in connection with the proposed Filey Sands event.

The following officers were elected:—President, Earl Fitzwilliam; vice-presidents, Messrs. A. M. Bosville, W. H. Thornton, B. Bagshaw, W. Penrose, and H. R. Kirk; hon. secretary, Mr. C. P. Wilson; hon. treasurer, Mr. L. Hey; hon. solicitor, Mr. A. Masser; committee, Messrs. A. H. Marriner, A. W. Roslington, T. Whitaker, A. W. Dougill, E. Faiers, H. A. Jones, R. Winn, E. H. Hepper, H. A. Johnson, W. Tempest, A. Exley, and Dr. S. Rumboll.

Amongst the new members of the club is Mr. R. Armitage, the Lord Mayor of Leeds. Mr. Alf. Dougill, who has retired from the hon. secretaryship of the club, has been succeeded by Mr. C. P. Wilson, of 5, Park Row, Leeds.



In connection with the Automobile Importers' Exhibition recently held in New York, considerable taste was displayed in the decoration of the building where the exhibition took place. "Pal," the well known French artist, was commissioned to paint a number of charming panels for the hall. Two of these we reproduce above, giving an idea of the extent to which the decorations were elaborated in connection with the show.

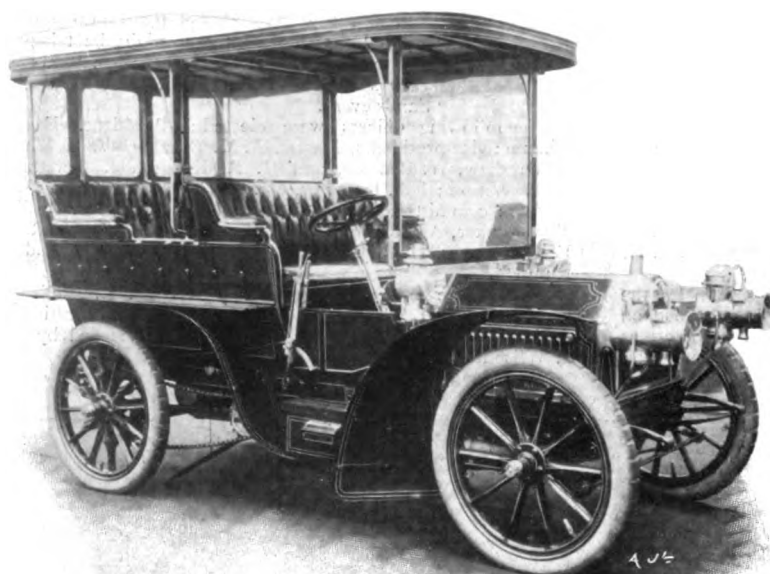


RACES, RECORDS, AND TRIALS.

Ormond-Daytona Beach Race Meeting.—The 1905 race meeting on Ormond-Daytona Beach will be memorable for the number of world's records which have been lowered, in spite of the extremely bad weather which has mainly prevailed during the week. We were able last week to record the splendid performances of Mr. Macdonald on the 6-cylinder Napier, not only for the unofficial world's record of 34 secs. for the mile, but also for the 5 miles world's record (official) of 3 mins. 17 secs. Mr. Macdonald followed up these successes by creating a new official world's record of 34½ secs. for the mile with the same car, equivalent to a speed of 104.65 miles per hour. In addition he made the best time for the flying kilometre, 23 secs., secured the Bowden Cup for the kilom. against Ross and Stevens with a time of 27½ secs., made a new 10 miles world's record in the Ormond Derby with 6 mins. 15 secs., beating the previous best by 16½ secs., secured the Thomas Trophy (20 miles), time 15 mins. 23 secs., against Wallace's Fiat and Fletcher's 80-h.p. De Dietrich, a splendid record for a British-built car at one meeting, competing against all the finest types of Continental racing

vehicles. It was on the Tuesday that Macdonald made his record of 34½ secs., against Louis Ross, on his steam car, 39 secs., and W. Wallace, on a 90-h.p. Fiat, 39½ secs.; H. Hawley, on a 90-h.p. Mercedes, 42 secs.; and W. K. Vanderbilt, 90-h.p. Mercedes, 42½ secs.; L. B. Bowden, on an 8-cylinder (2 motors) 120-h.p. Mercedes, was for the mile timed in 34½ secs., showing ½ sec. better than Macdonald's performance, but he was disqualified from taking the record owing to his car being found to be over-weight, the actual scaling being 1,179.2 kilograms. The record therefore rests with Macdonald.

The Dewar cup, over a mile, was in the final secured by Louis Ross on his steam car, in the time of 42 secs., against Macdonald's 42½ secs., and Wallace on the Fiat 48½ secs., Oldfield in the final being left 50 yards behind. Curiously in the race for this cup no competing car, except the Fiat, made as good time in their respective heats as in the final, thus Ross was timed in his heat for 41½ secs., and Oldfield who was completely out of it in the final, secured 40½ secs. in his heat—a better time than the cup was finally won in. An icy wind was blowing during the whole day, which developed



BIRMINGHAM EXHIBITION.—The handsome Napier Car, shown by Newey's Midland Garage.

later into a veritable tempest, necessitating part of the race programme of the meeting being temporarily adjourned.

On Wednesday, Louis Ross did best over the mile with 38 secs., and the kilometre race for standard cars was secured by Webb Jay on a 15-h.p. White in 44 $\frac{2}{5}$ secs.

The Corinthian Mile Race for amateurs brought forward 16 runners, the Cup finally falling to Ross with 41 $\frac{3}{5}$ secs. The previous heats in this race were won by Vanderbilt, Stevens and Ross with 57 $\frac{2}{5}$ secs., 47 $\frac{2}{5}$ secs., and 42 $\frac{2}{5}$ secs. respectively.

For the flying kilometre, Macdonald was at the top with the 6-cylinder Napier in 23 secs., although this time is 2 $\frac{1}{2}$ secs. slower than Barras's world's record on a Darracq car. Bowden on his Mercedes was three-fifths slower than Macdonald, and Ross was timed for 24 $\frac{1}{5}$ secs., whilst Stephens on Gray Dinsmore's Mercedes car, which Jenatzy drove in the Taunus, only scored 26 $\frac{3}{5}$ secs., W. K. Vanderbilt bringing up the tail with 28 $\frac{3}{5}$ secs.

In the Open Kilometre Race Ross was again successful in the final in 27 $\frac{2}{5}$ secs. In the 10 Miles Open event Macdonald was timed in his heat, which he won, for 7 mins. 6 secs., against Thomas's 7 mins. 10 $\frac{2}{5}$ secs. for his heat. In the longer distance races, in the 50 Miles Race for the Lozier Trophy, open to American-built cars only, Walter Christie's 60-h.p. car, designed by himself, gained first place in 1 hr. 11 mins. 20 $\frac{1}{5}$ secs., beating Webb with the Pope Toledo and Oldfield on the Green Dragon.

The Vanderbilt Trophy for 100 miles was secured by H. Fletcher with his 80-h.p. De Dietrich car in 1 hr. 28 mins. 24 secs., which time

creates a new world's record, beating the previous best time by over 23 mins., viz., E. Voight, on a Panhard at Long Island on April 1st, 1902, time 2 hrs. 5 mins. 9 secs. Bernin, on a 60-h.p. Renault, was 2nd, in 1 hr. 21 mins. 38 secs.; Sartori, 3rd, on a 90-h.p. Fiat, 1 hr. 21 mins. 44 $\frac{1}{5}$ secs.

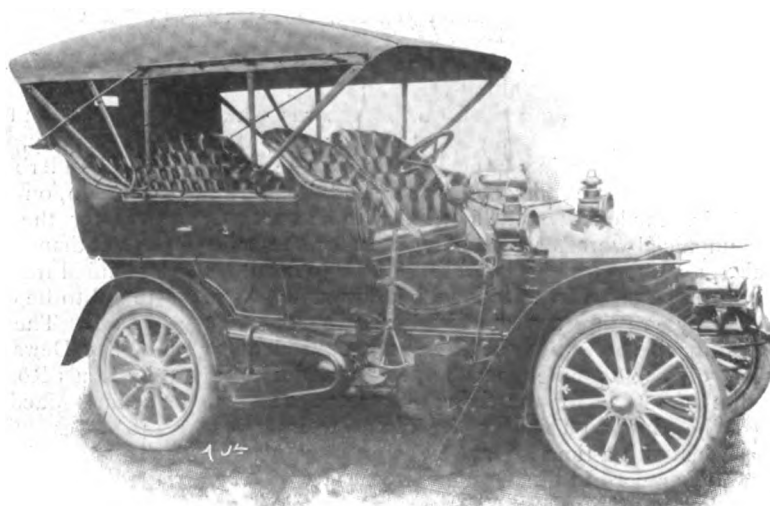
In the competitions for special cars the Fiat Trophy Race over 10 miles was secured by Wallace, on his Fiat, he beating Sartori with the time of 6 mins. 54 $\frac{2}{5}$ secs., whilst in the contest for the Mercedes Trophy over the same distance E. R. Thomas, against Shanley Breese and Stephens, put up a new world's record for 10 miles of 6 mins. 31 $\frac{4}{5}$ secs., lowering Vanderbilt's previous world's record on the same course last year of 6 mins. 50 secs.

For the Brokaw Cup (5 miles) E. Thomas made the best time of 3 mins. 30 secs.; Wallace, on his Fiat, next, in 3 mins. 46 secs.; and Sartori third in 4 mins. 15 secs.

In the Ormond 5 mile handicap, Sartori's (34 seconds) time was 3 min. 57 secs., on a Fiat; Thomas (scratch) on a Mercedes, 4 mins. 2 $\frac{2}{5}$ secs.; Wallace (19 secs.), Fiat, 4 mins. 4 $\frac{1}{5}$ secs.

Fletcher again scored best time in the 50 mile handicap, creating another world's record for the distance in 38 mins. 51 secs. Sartori, on a Fiat, however, with 4 mins. allowance, secures the first prize with a time of 40 mins. 20 secs., this time also being better than the previous world's record of 40 mins. 49 $\frac{4}{5}$ secs.

Bowden, on his big 8-cylinder Mercedes, succeeded on Monday in covering the mile in 32 $\frac{2}{5}$ secs., equal to 109.75 miles per hour, and was timed for the standing kilometre in 20 $\frac{2}{5}$ secs., equal to 174.75 kil. per hour.

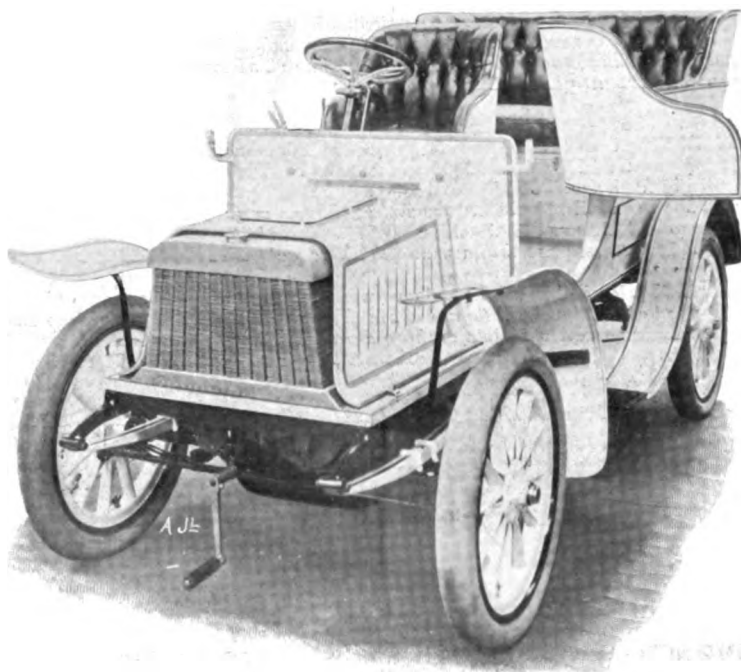


BIRMINGHAM EXHIBITION.—The 16-h.p. Wolseley Car fitted with a Roi des Belge phaeton side entrance body, and with a double extension Cape hood.

Amongst a certain section of the competitors, discontent at the arrangements is reported, and rumours are abroad of the formation of a new association for the purpose of holding and controlling other meetings.

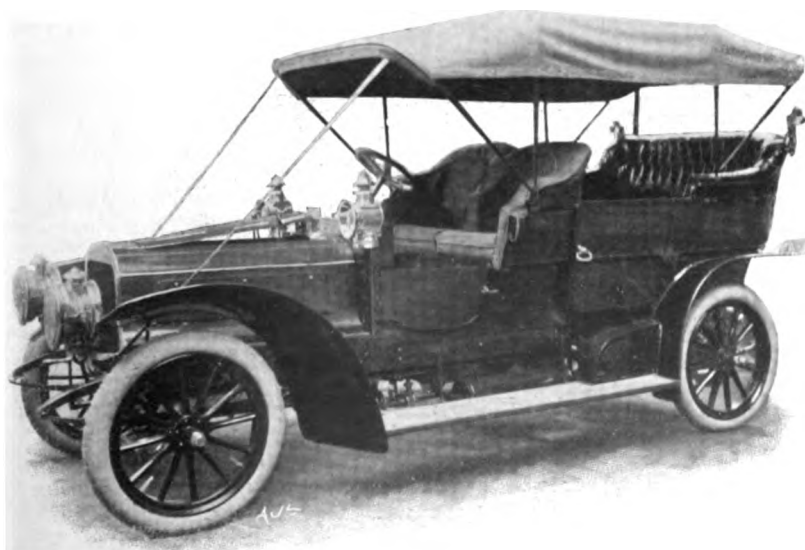
Gordon-Bennett Race and Grand Prix.—Entries for the French eliminating trials on Tuesday numbered 22. The new entrants were 3 Darracqs, 3 Renaults, 3 Mors, 3 Bayard-Clement, and 3 Hotchkiss cars. The list closed on Feb. 1st.

M. Georges Prade, who is no less noted as an automobile journalist for the sensible view he takes of most situations as for his brilliant writing and powers of description, has, in the columns of our contemporary, *Les Sports*, raised his voice against the attitude which has been assumed by the French Club in regard to the Gordon-Bennett Race and Grand Prix—a point of view in which he is supported by an article in a paper of no less standing and general importance than the *Figaro*. Both M. Georges Prade and the writer in the *Figaro* are in favour of making the Grand Prix an entirely open race, by which is presumably meant a race to which foreign competitors will be admitted on equal terms with Frenchmen, and not merely by invitation limited to a certain number. In addition, M. Georges Prade says that the line recently taken by the French Club is practically bringing about a rupture between that body and the other international automobile clubs, a result which cannot have any other effect than to deprive the Automobile Club de France of a great proportion of its influence and prestige. The inadvis-



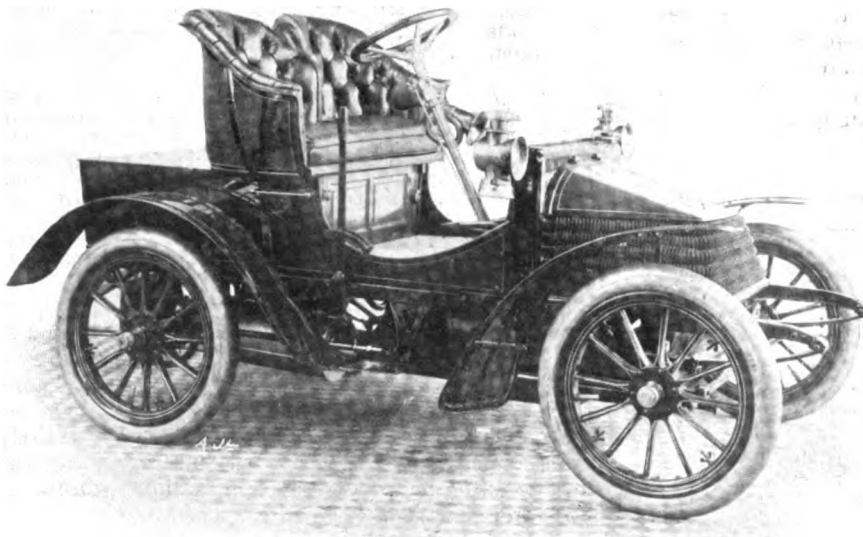
BIRMINGHAM EXHIBITION.—An 8-h.p. Alldays Light Car, fitted with four-seated body, having a hinged front seat to give access to the tonneau.

bility of such a course is forcibly illustrated by M. Prade by recalling the occasion in 1900 when the support afforded to the A.C. de France by the other European clubs in its dispute with the Moto Club, enabled the former body to exercise a degree of authority and influence which, without the support of the representative clubs of other countries, it would never have been able to maintain. Furthermore, M. Prade takes precisely the same view as we have enunciated ourselves, that in so far as France restricts the number of foreign competitors admitted to the event, she deprives the winning of the race of all value, and concludes: "*A vaincre sans péril, on triomphe sans gloire.*"



BIRMINGHAM EXHIBITION.—The 24-30-h.p. Mobile Car with Cape Cart hood. This vehicle, which has a 9 ft. 6 in. wheel base, and is fitted with an "Aster" engine, has very long side springs, and is of the chain-driven type.

Sydney to Melbourne Reliability Trial.—Australia is to have a motor reliability contest in somewhat like manner to the Indian competition just concluded. This has been mainly brought about by the Dunlop Tyre Company in order that the possibilities of motor cars may be better appreciated in Australia for use over the rough Australian roads and tracks. A motor cycle reliability contest will also be held practically on the same lines as the car section. The course will be between Sydney and Melbourne, following the old overland coach route, and covers a distance of about 572 miles. This comprises 343 miles of good roads, 140 miles of second-rate roads, and 89 miles of bad roads. All



BIRMINGHAM EXHIBITION.—One of the well-known little 6-h.p. Wolseley Cars, fitted with bucket seats.

classes of made and unmade thoroughfares and tracks will be encountered, whilst the New South Wales section is over mountainous roads that will test the hill-climbing capacities of the most ambitious climber. The distance is divided into five sections, one of each to be covered by contestants on successive days, starting from Sydney on Tuesday, 21st February, 1905, and finishing on Saturday, 25th February. The selected sections are as follows: Sydney to Goulburn (129 miles), Goulburn to Gundagai (121 miles), Gundagai to Albury (121 miles), Albury to Euroa (101 miles), Euroa to Melbourne (100 miles).

Long Distance Tyre Test.—Last year, it will be remembered, that following the Anti-Skid Trials held in Paris it was determined to allow the competitors to prove the durability of their devices by taking a test run from Paris to Nice and back. This competition was deemed so successful that this year it is to be dealt with in a more elaborate form. One proposition is to institute, about the end of February, a long distance run from Paris to Vienna, Vienna to Berlin, and back to Paris. This is to be a test of pneumatic tyres, anti-skid devices, and wheels. The detailed rules have not yet been determined upon, but it is proposed that, as far as possible, all four wheels of each entered car shall be of a uniform type. Each stage will be about 400 kiloms., and cars under 14-h.p. will not be admitted. It is thought, however, that this tour is too ambitious, and a counter proposition which appears acceptable is that competing cars should travel from Paris to and round the Auvergne circuit then back to Paris, and continue to repeat the performance until either the competitors

or their tyres and anti-skid devices are tired out.

2,000 Miles Commercial Vehicle Trial.—The Straker-Squire "omnibus," under the observation of the Automobile Club, by Saturday last had got well into its second thousand miles, and continues to make successful daily journeys. Since our official report, published last week, the following are the results of the journeys made, the mileage covered, and the incidents by the way:—

Wednesday, January 25th.—Great North Road. No involuntary stops. Changed 1 plug; tightened 2 compression taps. Distance 100 miles.

Thursday, January 26th.—Banbury Road. Distance 101 miles. Driver had to drop down 2 speeds on a hill; car stopped momentarily before the low speed could be got in. Changed 1 plug. Changed

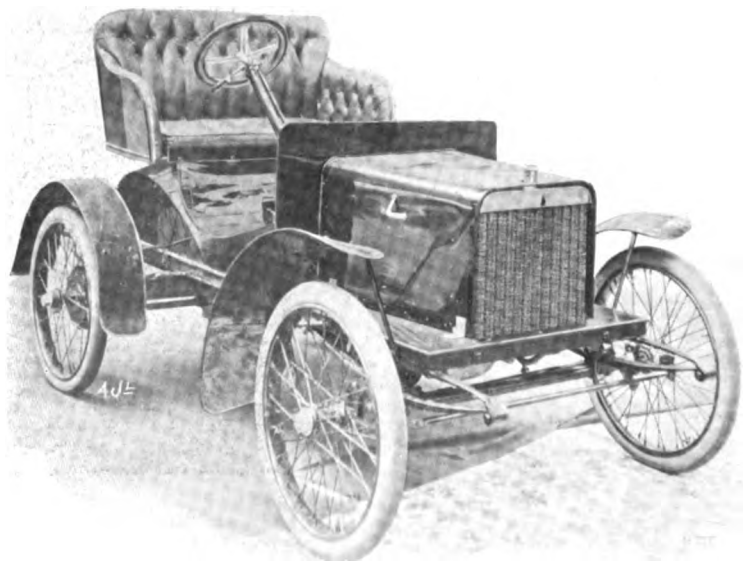
axle cap from near front to off front wheel, latter having been lost.

Friday, January 27th.—Bath Road. Distance 100 miles. No involuntary stops. Changed accumulators; new axle cap fitted.

Saturday, January 28th.—Exeter Road. Distance 100 miles. No involuntary stops. Foot-brake adjusted. Magneto taken to pieces and cleaned.

Monday, January 30th.—Oxford Road. Distance 100 miles. Engine stopped on Aston Hill, 6½ mins. Total distance since last involuntary stop, 294½ miles.

Tuesday, January 31st.—Coventry Road. Distance 99½ miles. Engine stopped on hill, 1 min., 62½ miles on. Stopped on another hill 24 miles on. Twenty gallons of petrol put into tank, making total petrol used 253 gallons. Adjustments in motor house: Exhaust pressure-valve cleaned; leak in pipe to pressure-gauge stopped; new split pin in near-side chain-bolt; replaced lost axle cap. Total distance to date, 1,703 miles.



BIRMINGHAM EXHIBITION.—The 6-h.p. Rover Light Car, which is being put on the market at one hundred guineas.

5,000 Miles Reliability Trial.—The 12-h.p. Siddeley car has so far, without serious mishap, come through the ordeal of its trial, under the regulations and observation of the Automobile Club. It is now plodding along with unabated vigour in its fourth thousand mile lap, although the weather has been anything but conducive to easy running. About Feb. 8th will probably be the concluding day for this remarkably fine 5,000 miles run. The official particulars of the daily runs since our last report are as follows:—

Wednesday, January 25th.—Worthing. Distance 148 miles. No involuntary stops. New spring in air valve in carburettor. Fan belt and chains tightened. Water pipes disconnected for examination.

Thursday, January 26th.—Folkestone. Distance 151½ miles. No involuntary stops. Water pipe leaking owing to faulty coupling up. Fan belt adjusted. Crack in water jacket rusted up with sal-ammoniac.

Friday, January 27th.—Brighton, *via* Worthing. Distance 149½ miles. No involuntary stops. New fan belt. More sal-ammoniac applied to crack. Nut on ignition lever bracket tightened.

Saturday, January 28th.—Southampton Road. No involuntary stops. Distance 151 miles. Chains taken off and soaked in tallow for the night. More sal-ammoniac applied to the crack in water-jacket.

Monday, January 30th.—Banbury Road. Distance 158½ miles. Wheels slipped on Sunrising Hill and two passengers dismounted. Total distance since last involuntary stop, 3,216 miles. Chains replaced after soaking in tallow. Side-brake lever wire straightened.

Tuesday, January 31st.—Southsea Road. Distance 148 miles. No involuntary stops. Total distance up to date, 4,047 miles. Petrol consumed to date, 247 gallons.

The off-side driving-wheel tyre has now run 1,054 miles without trouble. The near-side driving-wheel tyre has run 940 miles without trouble.

PRINCE ARENBERG has placed a sum of 500 francs at the disposal of the A.C. de France for the purpose of establishing a prize for the best protection for the hands of a driver of a motor car. The protection for the hands must be of such a nature as to guard entirely against the cold, whilst driving, but must not in any way interfere with the conductor's free action, hearing or vision on either side.

MOTOR CYCLING.

Light Weight Motor Bicycle Trial.—Although considerable opposition has been manifested to the holding of trials for light weight machines from April 3 to 10, the Auto-Cycle Club considers that trial for such machines is not only desirable, but would serve to create an additional interest in motor cycles at a period when many men are hesitating as to whether they shall purchase a new push cycle or make the plunge on to a motor cycle, and it is to these that the light-weight bicycle will particularly appeal. The club have, therefore, decided to issue particulars of the proposed trial, and if there is sufficient response from the trade the trial will take place as arranged; if however, the trade, or that section of it interested in light weights, show they do not want it, by not entering, the matter will be dropped. In any case, the annual trials will have a class for light-weight machines. It should be, however, clearly understood that if the particular section of the trade referred to does not want a trial early in the year, there is no desire on the part of the club to promote such an event out of sheer love for trials.

WE would remind our readers that Wednesday, February 8th, is the day on which Professor H. L. Callendar will read his paper on "A Variable Motor Cycle Gear" before the Auto-Cycle Club.

International Motor Cycle Cup.—June 18th has now been definitely fixed for the running of this cup in France, the French Eliminating Trials taking place on June 4th. The British Eliminating Trials for this race are to take place about May 31st in the Isle of Man. The response to the Auto-Cycle Club by the motor cycle trade in regard to entering for these trials has been of a satisfactory character, and it is hoped that the fund which is being raised to guarantee the expenses will be sufficient to cover all costs which may be incurred in organising the trials and recompensing the makers who take part therein. Mr. Edge's 100 guineas started this fund, and the Auto-Cycle Club have added to this 25 guineas.

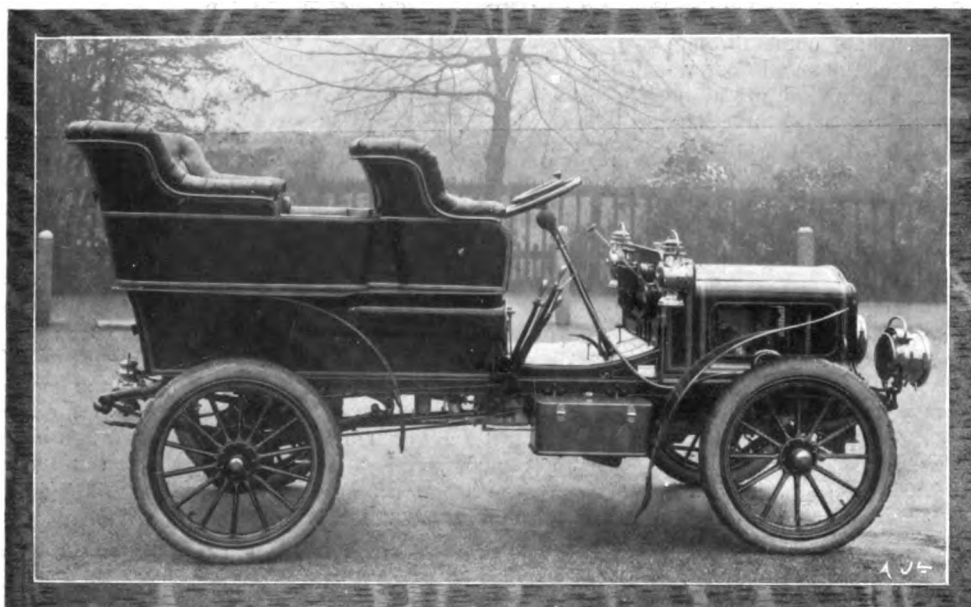
IN connection with these trials the club will take an opportunity of promoting a big open race, open to motor bicycles of any sort or kind, weighing not more than 50 kilogs., for "The Motor" Cup, a perpetual trophy to be competed for annually. It is hoped that this event will

induce some of the foreign crack riders to come with their machines and take part.

IN the Motor Bicycle Contest, under the auspices of the Motor Club of Turin, which was held in connection with the Turin Automobile Salon, out of 14 starters, 7 successfully accomplished the full course, a distance of 58½ kilometres, starting from Turin. Riva, on a Peugeot, was first in 59 mins. 6 secs., and Reale, on a similar make of machine, second in 60 mins.



Prince Eitel Friedrich, the second son of the Emperor of Germany, who is at present unfortunately suffering from inflammation of the lungs, is, like his august father and his brother, the Crown Prince, a patron of automobilism. In the photograph which we here reproduce, he is shown with an Opel Darracq car, which has been specially designed for sporting purposes, standing at Sobentz, near Berlin, a spot which was rendered famous by Frederick the Great.



Sir Walter Hely-Hutchinson, G.C.M.G., Governor and Commander-in-Chief of the Cape of Good Hope, has for some time been the owner of a 10-h.p. White Steam Car, and as the result of his experience with that type of vehicle, he has recently secured one of the new 15-h.p. vehicles, a photograph of which we are able to reproduce above. The car accompanies Sir Walter to South Africa this week. The type of body has been selected by the White Steam Car Company as their standard 1905 pattern.

Olympia Exhibition.—Arrangements have been made in connection with trial runs at Olympia whereby cars for the purpose of giving such trials may stand inside the walls on the west side by the Hammersmith gates. These cars will have to bear a special label, which can be obtained in advance by exhibitors requiring them from the Society, on payment of 1s. per label. Passengers so taken out can be passed back into the Exhibition by means of special passes provided by the Management.

Northampton Institute.—Mr. H. M. Hobart has been appointed Lecturer in Electrical Engineering Design in succession to Mr. E. Kilburn Scott, who has been appointed Lecturer in Electrical Engineering in the University of Sydney. Mr. M. Holroyd Smith has been appointed Chief Assistant in the Mechanical Engineering Department, in succession to Mr. W. E. Curnock, who has been appointed Head of the Mechanical Engineering Department of the Technical College, Huddersfield.

Motor Volunteer Corps.—The annual din-

ner of the corps, at which Earl Roberts is to be the principal guest, has been postponed from February 13th to February 14th.

British International Cup for Motor Boats.

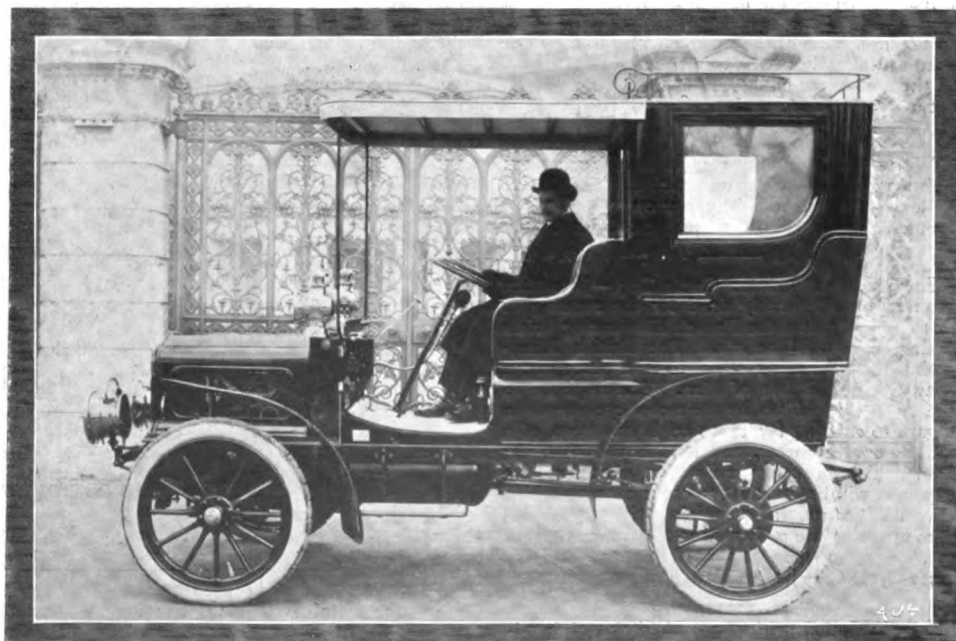
—The entries for this important fixture closed on Tuesday last. Up to the end of last week the only formal challenge actually received by France, the holders of the Cup, was from the A.C.G.B.I.

LAKE LUCERNE Motor Boat Race Meeting has been fixed to take place on September 12th and 14th next.

ANOTHER record mountaineering feat is reported from Buenos Ayres. A De Dietrich car of 24-h.p. has crossed

the Andes, in spite of the snow and the awful roads, from the Eastern Plains to Valparaiso. The car originally started from Buenos Ayres, and crossed passes in the Andes 5,000 feet above the sea level.

NOTE.—"The Automotor Journal" Stand (No. 3) at Olympia is on the left, immediately inside the main entrance, facing Addison Road Station.



Our photograph shows the first of the 15-h.p. Limousine cars supplied by the White Steam Car Company on this side of the water. This identical vehicle has been purchased for a French customer, who is proud to be the possessor of the first of this type on the Continent.

ON February 9th Mr. J. S. Critchley, M.I.M.E., &c., will read a paper on "Steel" at the Automobile Club.

Automobile Club Annual Dinner.—This dinner has had to be postponed *sine die*, owing to the meeting of Parliament, and the holding of a Court by H.M. the King, on February 15th.

A MOTORIST was recently passing the village of Ayton, when two female farm workers hailed him and asked him to give them a lift. They got a lift—as far as Edinburgh, some 40 miles off, where the motorist provided the "lassies" with refreshments and sent them back home by train.

A MOTOR service is to be instituted between Herne Bay and Canterbury, under the official control of the South-Eastern and Chatham Railway Company, commencing on March 1st. The service, which will be run under contract, will be timed to meet the trains at regular intervals at both towns.

MANUFACTURERS are at times the recipients of orders, the nature of which often suggests that they originate from the practical joker. Not the least curious of those which have come to our notice is that which a gentleman sent to Components, Limited for a $2\frac{1}{2}$ -h.p. Fleet motor bicycle "to ride about for business or pleasure, and to use for driving an emery wheel for grinding the knives of lawn mowers."

IT is proposed to hold an Automobile Exhibition in April or May next at Geneva, jointly under the auspices of the Swiss Chambre Syndicale de l'Automobile and the Swiss Automobile Club.

LAST autumn we announced that an Italian Automobile Club was to be founded as a controlling body, on similar lines to the A.C. de France, the A.C.G.B.I., &c., and this information was confirmed officially during the Paris Salon. The necessary formal steps have now been completed for the foundation of this club, under the title of the Automobili Club d'Italia. The headquarters will be at Turin. The Marquis Lorenzo de Ginori-Lisci (vice-president of the Florence A.C.), has been elected president, and the vice-presidents are Marquis Ferrera - Vintimiglia and the Chevalier Augusto Massoni. Count Vigliessi will act as secretary, and the sporting section will have the Marquis of Saragna as its chief. One of the first results of this new formation is that a big sporting automobile meeting is to be organised for the month of March. This will include a tourist car endurance competition, steering trials and speed tests, and finally a gymkhana to be held in Turin.

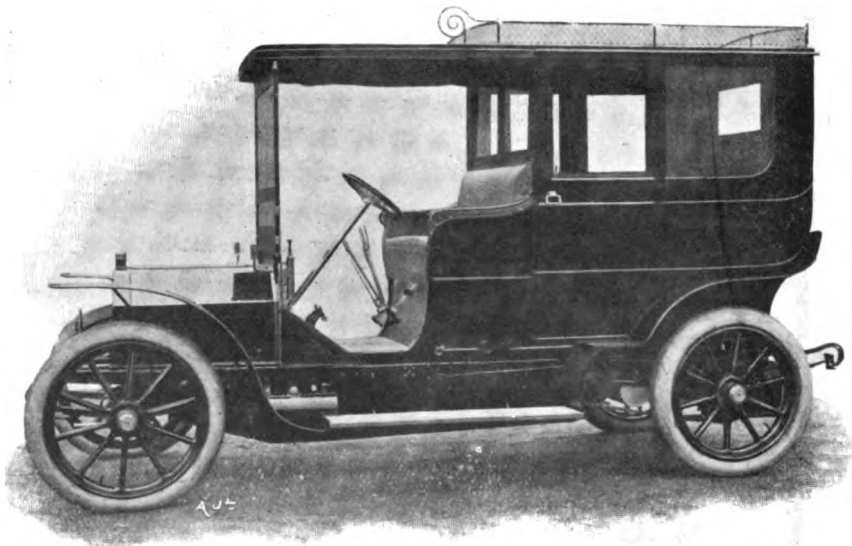
DOINGS OF PUBLIC COMPANIES.

Car and General Insurance Corporation, Ltd.—We were able the week before last to give a résumé of the directors' report of this company, which showed a very satisfactory start. On Wednesday of last week the first annual general meeting took place of the Corporation, when Mr. E. Manville, M.I.E.E., the chairman of the company, presided. The chairman opened his remarks by congratulating the shareholders upon the results of the first year's operation, and, continuing, drew attention to several points in connection with the business. They had received over £30,000 in premiums, an amount far beyond their expectations, the whole of which had been carefully selected. This was due to the policy of securing an efficient agency organisation and to their policy contracts, which were simple and liberal and free from vexatious conditions. The question of securing business had never been a cause of anxiety, but only as to the selection of the business offered. The net result of the operations was an available balance of nearly £1,900. The directors, he said, were most desirous of cultivating insurances under the Workmen's Compensation Acts, and he invited all employer of labour and all owners of vehicles, however propelled, to give them through their insurance brokers an opportunity of quoting for their insurance.

With regard to motor car risks, he took the opportunity of affirming that, without wishing to appear to needlessly frighten, there were peculiarities incidental to the undertaking of motor car insurances which were incomprehensible and mere pitfalls to other than the practical insurance motorist—for instance, at the present time some of their competitors, after more or less copying their policies and even under-cutting their rates, declaring that their rates were altogether too low; whereas they were considering at the present moment the advisability of making further concessions in the light of actual experience.

Before concluding, the chairman, on behalf of himself and co-directors, expressed a very high appreciation of the energy, ability, and devotion which Mr. Frederick Thoresby, the general manager of the company, and his staff had displayed during the year in the interests of the company. The arduous work had involved them working not only all the hours of the day, but a great many of the night, and a public recognition of those services he considered was due to them.

Mr. Frederick Thoresby, in response, placed a large share of the credit for the success of the Corporation business to the hearty assistance and whole-hearted support of the directors, who were all successful business men, and it was to that that he attributed chiefly the success of the company.



In the above photograph which we have received from the Cannstatt Automobile Supply Association, is seen a side-entrance 18-28-h.p. Mercedes car, the carriage portion of which has been built by Messrs. Hooper and Co., the well known carriage builders. The vehicle is a fine specimen of the carriage-builder's art, and affords ample accommodation for six persons.

POINTS OF LAW.

COMMERCIAL POINTS.

A Precedent.—It is satisfactory to be able to record that in the case of a motor cyclist who came suddenly on a dangerous, unlighted piece of freshly metallised unrolled road near Settle, and in consequence was thrown off his machine, the local County Court awarded him £6 11s. damages against the local Rural District Council for damages to himself and his machine. We trust this decision will serve *pour encourager les autres*.

Is the Park 10-Mile Limit Legal?—In a case precisely similar to that on which we comment editorially this week, Mr. H. E. Gwinner of Hollands Villas, Kensington, was last Wednesday charged before Mr. Marsham at Bow Street with having exceeded the 10-mile limit imposed by the police on Constitution Hill. Mr. Firth, who again adopted the same line of defence, namely, that the "regulations" had never been placed before Parliament, produced Mr. Ambrey Court, an official of the House of Lords, who proved that no regulations had been laid on the table of the House of Lords since the 28th of April, and that there was no mention of a 10-mile limit for motor cars in the park regulations, which Parliament had approved, or indeed any mention of motor cars at all. Mr. Marsham, after retiring to consult with Sir Albert de Rutzen, before whom a similar case had been brought on the previous day, decided to reserve his decision till the case which had already come before Mr. Kennedy, and was adjourned by him till the 14th, should be settled.

As a result of the competition of accumulators, dry cells, and motor car lamps, in connection with the Brussels Salon, a remarkable series of successes have been scored in these accessories by the make of articles specially represented in this country by M. Andre A. Godin, of Red Lion Square. For ignition accumulators the Dinin takes the first prize; for dry cells the Société Electrique Hydra secure the same high honour, whilst Dinin also obtains a médaille d'honneur for electric traction accumulators. In the competition of headlights, Ducellier comes out at the top with first prize.

Friswell, Limited.—At the annual general meeting held on Tuesday, of this company, we are informed a dividend of 10 per cent. was declared on the ordinary shares, and 6 per cent. on the preference. £3,733 4s. 6d. was written off the goodwill account, and £20,961 13s. 4d. was carried forward.

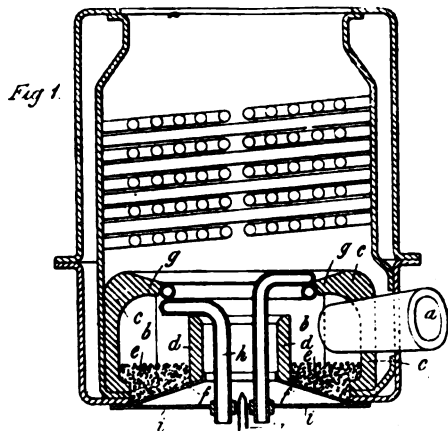
THE Artillery Wheel Works, Limited, have, we learn, appointed the Coventry depot of the United Motor Industries, Limited, as their Midland headquarters. The feature of the Artillery Works is the twin spoke wheel, which is constructed to specially withstand severe side strain, a source of such serious trouble in manufacturing wheels.

The Orion motor 'bus which has been under test running on the Hammersmith Road by the London General Omnibus Company, was last week, we learn, thoroughly examined and inspected by the omnibus company's engineers. The condition of the whole of the mechanism was found in such satisfactory condition that Messrs. Moss and Wood, the concessionaires for this type of vehicle, inform us they have received an order from the L.G.O.C. for a large number.

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, 232, Strand, W.C.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

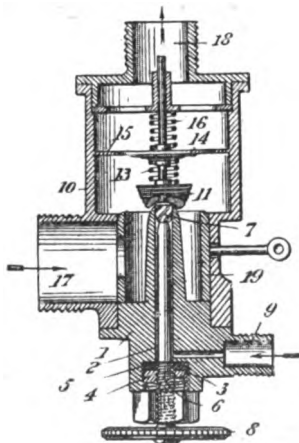
5218. 2nd March, 1904. Impts. in and relating to the Burning of Liquid Fuel. John Badger, 79, Tubbs Road, Harlesden, London. The object of this invention is to effect a more complete combustion of the fuel, a greater efficiency, and a reduction of the noise. There are two figures. The drawing



shows a vertical cross-section of the invention as applied to a small boiler. The flame from the burner first passes into a tapering tube, *a*, of refractory material, which projects into an annular and endless regenerative track or fire-box, *b*, made up of segmental bricks, *c*. The inner wall of the track is formed of a central vertical tube, *d*, also in refractory material, and on the bottom of the track is a layer of broken refractory material, *e*, resting on the plate, *f*. Between the tube, *d*, and the inner or projecting edge, *g*, of the segmental bricks, *c*, is an annular space for the passage of flame to the boiler tubes. Placed in this annular space and supporting the edges, *g*, is a coil, *k*, which may be used either to superheat the steam or to heat the feed-water. A perforated plate, *i*, is provided below the central tube, *d*, for the admis-

sion of further air to the flame, which air becomes heated before mixing with the whirling flame issuing from the annular space between *c* and *g*, so effecting a complete combustion of any gases from excess oil or unconsumed fuel passing out of the regenerative track. The pipe, *j*, is for the supply of additional air under pressure.—Jan. 25th, 1905.

21900. 11th Oct., 1904. Impts. in or relating to Carburettors for Internal Combustion Engines. Prosper Dannels and another, 69, Rue des Remouleurs, Gand, Belgium. The object of this invention is to provide a carburettor for motor vehicle engines,



which will use either heavy or light liquid hydro carbons. There are nine figures. Fig. 1 is a vertical section in the central plane. The petrol feed-plug, 1, having the central petrol-passage, 2, is provided at its lower end with a thread, 3, and an inner nut, 4, fitting same; also a screwed packing piece or washer, 5. Passing through the nut, 4, and washer, 5, is a screwed spindle, 6, carrying the milled wheel, 8, for adjusting the spindle. The end of the spindle, 6, has the increased diameter, 7, which has

cut on it spiral grooves for the passage of petrol, forming a sort of rose to minutely sub-divide it. The petrol enters at the passage, 9, and passing the rose, 7, is carried by the suction into the mixing-chamber, 10. The grooves of the nozzle, 7, increase in depth from top to bottom, so that the feed of hydro carbon can be regulated by turning the hand-wheel, 8. The corrugated cone-shaped valve, 11, fits over and closes the nozzle. Its spindle carries the springs, 13 and 16, and the disc, 14, loosely fitting the spindle between the springs. When the suction commences, the di-c, 14, which fits the passage, 15, is raised and lifts the valve, 11, off its seat, permitting the flow of liquid from the grooves in the nozzle. The liquid is mixed with hot air entering the carburettor through the passage, 17, and the mixture of hot air and hydro carbon passes by the passage, 18, to the motor. If a back fire should occur, the pressure on the disc, 14, forces it down against the spring, 13, to allow the gases to pass to the atmosphere by the passage, 17. The cylindrical shutter, 19, regulates the quantity of air permitted to enter. Nothing is said in the specification about a stop or pin being fitted to the spindle to limit the upward movement of the disc, 14, but obviously something of the sort would be necessary or the valve, 11, would not be lifted.—Jan. 25th, 1905.

Patent Specifications Published.

Applied for in 1904.

Published January 19th, 1905.

- 21,556. C. D. B. PAYNE. Carburettors.
- 21,993. HULSE AND CO., LTD., and others. Variable speed mechanism.
- 24,168. OLDS, MOTOR WORKS. Carburettors.
- 24,558. SOC. ANON. WESTINGHOUSE. Carburettors.
- 25,479. J. F. MURPHY. Running-gear.
- 25,548. E. E. LEHWESS. Self-propelled vehicles.
- 25,723. S. FURMIDGE. Springs.
- 26,006. W. F. BURKE. Internal combustion engines.
- 26,097. A. C. EASTWOOD. Magnetic clutches.

Published January 26th, 1905.

- 140. E. LEE. Motor cycle hubs.
- 215. C. J. PAFARD. Speed indicator.
- 551. A. G. MELHUISH. Internal combustion engines.

The Automotor Journal, February 11th, 1905.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

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In our issue of January 28th, we recorded the fatal mishap to Mr. Frank Croker, the well-known American amateur racing man, who, in trying to avoid a motor cyclist who had crossed his path, killed both himself and his chauffeur. We were able the same week to publish a photograph of Mr. Croker driving his Simplex Car in the Vanderbilt Cup Race. In the very interesting picture which we give above, Mr. Frank Croker is seen on the left leaning on his racer, talking to Mr. W. Gould Brokaw on the Ormond-Daytona Beach. This unique picture was taken immediately before his fatal ride.

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DIARY OF FORTHCOMING EVENTS.

British Events.

1905.

Feb. 10-18 ...	Society of Motor Manufacturers' and Traders' Exhibition at Olympia.
Feb. 10 or 17 ...	*Quarterly 100 Miles Trials.
Feb. 14 ...	Motor Volunteer Corps Dinner (Trocadero).
Feb. 16 ...	*Touring Experiences in Ireland, by Mr. R. J. Meccredy.
Feb. 23 ...	*Motor Boats—Present and Future, by Mr. A. F. Evans.
Feb. 24-Mar. 4 ...	Edinburgh Motor and Cycle Show.
Feb. 24 ...	Manchester Motor Show.
Mar. 3-11 ...	Liverpool Motor Cycle Show.
Mar. 8 ...	*A.C.G.B.I. General Meeting.
Mar. 18-25 ...	Cordingley & Co.'s Exhibition (Agricultural Hall).
Mar. 25 ...	Motor Cycling Club Brighton Run.
Apl. 3-10 ...	Auto Cycle Club Light-weight Trial (1,000 Miles).
Apl. 29 or May 1 ...	May Day Parade
May 6... ...	Auto Cycle Club Hill Climb.
May 11-13 ...	Scottish A.C. Reliability Trials.
May 12 or 19... ..	*Quarterly 100 Miles Trials.
May 13 ...	Auto Cycle Club Members' Penalty Run.
May 20 ...	200 Miles Trial (Motor Cycling Club).
May 30 ...	*Gordon-Bennett British Eliminating Trials.
May 31 ...	Auto Cycle Trials and "Selection" Race.
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.).
June 10 ...	London-Edinburgh (Motor Cycling Club).
June 24 ...	100 Miles Passenger Trial (Motor Cycling Club).
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 8... ...	Auto Cycle Club Consumption Trial.
July 13 ...	*Hill-Climb (Henry Edmunds Trophy).
July 19-22 ...	*Brighton Speed Races.
July 24-28 ...	*Motor Boat Trials (Southampton).
July	24 Hours Run (Motor Cycling Club).
Aug. 11 or 18 ...	*Quarterly 100 Miles Trials.
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 19 ...	*Van Trials, Light and Heavy Vehicles.
Aug. 26 ...	Inter-Team Trial (Motor Cycling Club).
Sept. 9 ...	Brown Cup (Motor Cycling Club).
Sept. 12 ...	Auto Cycle Club Race Meeting.
Sept. 14 ...	*Tourist Trophy (Isle of Man).
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).
Sept. 18-Oct. 3 ...	*Reliability Trials.

* Automobile Club of Great Britain and Ireland Events and Papers.

Oct. 4 ... *Speed Trials.
Nov. 10 or 17 *Quarterly 100 Miles Trials.

Foreign Events (Trials, Races, &c.).

1905.

Feb. 4-19 ...	Berlin Automobile Exhibition.
Feb. 11-25 ...	Cannes Automobile Fortnight.
Feb. 13-16 ...	Detroit Exhibition.
Feb. 15 ...	Turin Automobile Salon.
Feb. 18-25 ...	Versailles Reliability Trials (A.C. Seine et Oise).
Mar. 13-18 ...	Boston Exhibition.
Mar. 15-Apl. 9	Copenhagen Exhibitio n.
Mar. 16-29 ...	Vienna Exhibition.
Mar. 27-Apl. 5	Washington Exhibition.
Apl. 2-16 ...	Monaco Motor Boat Fortnight.
Apl. 14-23 ...	Nice Automobile Week.
Apl. 17 ...	Speed Mile and Kilometre (Nice).
Apl. 18 ...	Coupe de Caters (Nice).
Apl. 20 ...	Coupe Burton (Cannes).
Apl. 20-21 ...	Cannes Motor Boat Meeting.
Apl. 23 ...	Coupe Provinciale (Nice).
May ...	Paris Industrial Vehicles Trials (A.C. France).
May 4-12 ...	Auto Cycle Club de France Tour.
May 11-25 ...	Stockholm Automobile Exhibition.
June 18 ...	International Motor Cycle Cup.
June 26 ...	Mont Cenis Hill Climb.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Calais-London (Motor Boats).
July 30 ...	Circuit des Ardennes.
Aug. 6-9 ...	Paris-Trouville (Motor Boats).
Aug. 10 ...	Gaston Menier Cup (Motor Boats).
Aug. 11 ...	Anthony Drexel Cup (Motor Boats).
Aug. 12 ...	International Cup for Motor Boats.
Aug. ...	Herkomer and Bleichroder Races.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Vincenzo-Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.

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PASSING EVENTS.

A "Walk-Over" for France.

THE German club, as we have already reported, is refusing to compete in the Gordon-Bennett Race, owing to its disapproval, shared by nearly all the other automobile clubs of Europe, of the proposal put forward by the French club to hold that race and the Grand Prix at one and the same time, and on one and the same course. We are glad to learn that the Committee of the Automobile Club of Great Britain, at its meeting held on the evening of Monday last, decided to adopt the same course, and also to communicate with the delegates of the other foreign automobile clubs, with a view to concerted action to the same end. The strongly worded resolution to this effect was as follows:—

That the secretary, or a committee, or delegates, be appointed to meet or communicate with delegates of other foreign automobile clubs, except the Automobile Club of France, in order to arrive at a unanimous decision that if the French club still persist in running the Gordon-Bennett and Grand Prix races simultaneously, they will one and all withdraw from both events; and that authority be given our representatives to concur in the decision.

As we have already pointed out, there is little doubt that this concerted action will be adopted by all the clubs concerned, and this will mean that there will be no Gordon-Bennett Race at all this year. France will, therefore, retain the Cup—but it will be a Cup from which all the glory and prestige will have been poured out! For next year, it is to be hoped, as we have already suggested, that representatives of all the national automobile clubs will meet together under the presidency of Mr. Gordon-Bennett, and so re-model the rules as to render the recurrence of this year's fiasco impossible. It is not surprising that, considering the determined attitude taken up by all the other European clubs, notably the German club, the Swiss club, and the A.C.G.B.I., that rumours are afloat to the effect that the French club is repenting of its "non-possumus" attitude, and is disposed to climb down. In other words, it is rumoured that there is a possibility of the two events not being held on the same day. Should this prove to be the case, we would be the first to congratulate the French club on having allowed its sense of fairness and its consideration for the other clubs to prevail. Our recognition of the change of attitude will be all the more hearty should it become apparent that the French club has changed its ground out of consideration for the other clubs only, but it is just conceivable that their action may be explained by the possible refusal of the French Government to allow the two races to be run at once—a contingency which, it will be remembered, we pointed out was a very probable one.

The Embankment and the Tramways.

"MORE power to the City Ward Motes! Meetings of these ancient bodies for the election of a Court of Common Council were held on St. Thomas's Day, the principal subject on which the elections were fought being the advisability of constructing tramways along the Embankment. We are glad to be able to state that the majority of those elected were chosen on the ground of their hostility to the proposed desecration." Thus we wrote some time ago. The pertinacity of the tramway people is unbounded, and would certainly in a good cause entitle them to respect. Time after time the

attempt has been made to procure permission to disfigure the Embankments in the manner that would be necessary for these lumbering conveyances to be run along it, and time after time the general sense of the municipality and of Parliament has been against them. Now the tramway people have brought the matter before the Court of Common Council, and the Court of Common Council has rejected the application with emphasis equal to that of the Ward Motes.

The tramcars have impeded the convenience, and in most cases defaced some of the most charming roads out of London. The old-world air of some of the most picturesque sites, notably the common opposite Hampton Court, has been destroyed by them. The one fine street of the capital—the Embankment, which is admired by all visitors to the Metropolis—is one of the few great thoroughfares which the tram has not as yet been allowed to invade. That the general sense of the community is strongly against the invasion there cannot be a doubt. But still, year after year the tramway people attempt to obtain the concession. It is not only in the interests of automobilists and other road users, to whom the unrestricted Embankment as it exists at present is often a haven of refuge, but in the interests of all who desire to preserve the few reminiscences of beauty and picturesqueness that the Metropolis still possesses that we protest against the desecration. And it is so utterly objectless as well. The working man, the chief patron of the electric trams, who jostles his neighbours and tears off ladies' skirts in his anxiety to obtain a place in what is called "the poor man's motor car," does not live along the Embankment nor is he employed there in any numbers, so its proposed tramification would not benefit him. It is not suggested that it would really benefit anybody; the inhabitants, or those whose business takes them along the Embankment, are the very people who are most opposed to the invasion.

The Tramway Becoming Superseded.

THE absurdity of the whole agitation is to be found in the fact that, as we have frequently insisted, the electric tram is becoming superseded by the motor 'bus. In a short time it is safe to prophesy—that is to say, as safe as prophesy can ever be—that there will be very few new electric tram lines permitted in the United Kingdom. For the Press has awakened to the arguments which we have been for some time urging that the motor 'bus can do all that the electric tram can do, and a great deal more. The electric tram service, we need hardly recapitulate, is inflexible. It can go along its rails, but nowhere else. If one of its own trams breaks down, or any other vehicle, for that matter, meets with a mishap across the tram lines, the whole service is brought to a standstill, and it is equally brought to a standstill, as has been demonstrated more than once on the South London tramways of the London County Council, whenever anything serious happens at the central station which provides the electric current. If there is a jam of the traffic on the road it is equally paralysed. None of these disadvantages are shared by a motor 'bus service. If one motor 'bus should happen by a misfortune to break down, it influences none of the others. The rest of the service goes on running with perfect equanimity. If a wagon or lorry comes to grief in the middle of the road, and cannot be removed for several hours, the motor 'buses dodge round it, and if there is no room in that particular street they take side streets. Similarly a motor

'bus service is not disorganised by a demonstration of the unemployed or a religious outbreak of revivalism. If its usual route is occupied by masses of demonstrating or ecstatic humanity, the motor 'buses can take side streets, and emerge into the general thoroughfare at a point where ordinary conditions, mental and physical, prevail. These are huge advantages of the motor 'bus as compared with the electric tram. Above all, they do not block the roads for other traffic when a breakdown occurs. But the most enormous advantage of all is to be found in the difference of initial cost. The daily Press is at last recognising the situation, and articles are appearing in a variety of papers pointing out the enormous burdens which have been placed on the ratepayers in the past and the enormous financial barrier that exists to the propagation and organisation of electric tram services in the future. The cost of the motor 'bus service is the cost of vehicles only. In an electric tram service the cost of the vehicles is relatively insignificant. It is the huge cost of the permanent track that runs away with the money. The permanent way of the electric trams promoted and organised by the London County Council is said to have amounted to some £26,000 per mile, and altogether some 60 millions is declared by the daily Press to have been spent altogether (out of the pockets of the ratepayers) on electric trams. And who can say that this enormous sum has provided the Metropolis with adequate means of locomotion? The tramways are destined to have a keen competitor in the motor 'bus services which are being organised, and this competition will possess the enormous advantage that if the demand for locomotion on any particular route on which the 'buses are placed diminishes, the motor 'bus can be transferred to another more populous and paying route without any additional expenditure. The motor 'bus has in fact come to stay. It is now a commercial and reliable vehicle, though there is no doubt whatever that in the near future it will be still further improved. Fifty omnibuses are on order by the General Omnibus Company, fifty more by the London Road Car Company, and forty-five divided equally between Messrs. Tilling, the Atlas and Waterloo Association and the Camden Association, while the Victoria Association has ordered seven. In a short time therefore we shall see at least 152 'buses plying on the London streets, and with their success, of which we have little doubt, the motor 'bus movement is certain to receive enormous extension. That the existing electric tramways will be abandoned we do not anticipate, though their abandonment would probably prove a boon to the general traffic. We do not anticipate that this result will take place, because they are mainly in the hands of an organisation which can do what it likes with the ratepayers' money, and which will probably continue to run the trams, at any rate, for a considerable length of time, even at a loss. Besides, the passenger traffic of London is so enormous that it can probably keep the two services going. But the effect of what we may, perhaps, be excused for terming the motor 'bus boom, will certainly be beneficial in preventing the extension of the electric tram in those districts where it is most objectionable, viz., the suburbs and the trunk roads running out of London. Here as we have stated above, mischief enough, both economical and social, has already been done. If the advent of the motor 'bus puts a term to the extension of this mischief, the automobile movement will have still further deserved the thanks and gratitude of the general public.

Of course, there is one circumstance that may have contributed to the enormous development of the electric tram. Where huge expenditure is involved, there are usually large commissions, and existence of such commissions is very often effective in inducing the municipalities to engage in expensive schemes rather than in schemes in which the first outlay is, relatively speaking, inconsiderable. Ten years ago the electric tram was a useful and a paying novelty. Towns like Hamburg have had the electric tram for considerably longer than that. London has only had it for a little over a year, and only, we may say, adopted it when it was threatened with supercession by the motor omnibus. The electric lighting muddle which prevails in the parish of Marylebone was described in a recent action by Mr Justice Swinfen Eady, as "a complete satire on municipal trading." It would seem as if the enormous electric tram extension of the Metropolis may soon be characterised in much the same terms.

♦ ♦ ♦ The Speed Question.

NOR so very long ago Mr. Moffat Ford, with that humorous enterprise for which he is distinguished, started a campaign with the object of showing that the rate at which the electric trams proceeded was far in excess of the 12-mile limit to which motor cars were at that date—it seems quite a long time ago now—restricted. The electric trams, it was proved, careered along at speeds up to 20 miles an hour. Recognising that the speed question will become an important one when the electric tram has to sustain the competition of the motor 'bus on a commercial scale, the Tramways and Light Railways Association recently addressed itself to the Local Government Board, requesting that the speed limits which in most parts of the Metropolis have been legally fixed by that body at 10 miles an hour, should be extended. The Local Government Board has replied that it is unable to accept the view put forward by the memorialists that, "except on very steep gradients, tramcars may safely be allowed to run at as high speed as motor cars," and the Board does not feel disposed to depart from the procedure it has hitherto adopted of fixing limits on particular tramways, in accordance with the special features of each particular case. On the whole, we think that the Board is adopting a wise and judicial attitude in this respect. It is obvious that a speed may be safely allowed to motor 'buses which would be most dangerous if systematically indulged in by trams. The motor 'bus can pull up, even at a high speed, in about three lengths, and if an obstacle suddenly presents itself at a short distance in front, it can, if unable to come to an absolute standstill, dodge round it. Not so the tram! Since Mr. Moffat Ford has abandoned his campaign, the authorities seem to have resumed their habit of winking at high speeds in the case of trams. This official partiality will be a serious matter when the motor 'bus is regularly competing with the electric tram, and should not, particularly after the recent pronouncement of the Local Government Board, be tolerated for a moment.

♦ ♦ ♦ A Word to London Cabmen.

WITH the motor 'bus becoming a recognised institution and a permanent feature of our streets, there is no doubt that the automobile cab will not tarry long behind. Already there are several of them plying for hire, and the leading types have been already described in our columns. When the convenient motor cab is once introduced in

large numbers, the "gondola of the London streets," as Lord Beaconsfield dubbed the hansom, will have to execute a strategic movement to the rear. The result of the competition between the two classes of vehicle will not for a moment be in doubt. The situation threatens, therefore, to become a serious one for the London cabman. That this is being recognised by the Cab Drivers' Union is shown by their action, to which we referred last week, of arranging to afford practical instruction to cabmen who are willing to learn how to drive automobiles. There is no doubt as regards the general position. We would therefore like to give a word of advice to the London cabbie. He will be wise if he determines to march with the times. Let him learn to drive an automobile cab, and so far from being a member of a profession which is becoming superannuated, he will probably realise that his services command an increased remuneration, and that he will be altogether better off than he was before. And it is only prejudice that stands in the way of his doing so. The experienced cab driver is far better suited to become a good motor cab driver than almost anybody else. To begin with, he knows London well, and that takes some learning. In the second place he is accustomed to the conditions of traffic. He can judge the width of his vehicle and his chances of getting through a hole in the traffic to a nicety, and that is half the battle in piloting a carriage of any kind through the ruck of traffic that prevails in most of our London streets. Also he has, as a general rule, a good steady nerve, and that also is needed. A certain ingenuity, in some sense perhaps almost amounting to inventiveness, may possibly be needed to enable an individual, without previous experience, to become an adequate manager of a motor. But these faculties the London cabman as a rule possesses, and his inventiveness has been from time immemorial proved by the fund of picturesque language which is almost invariably at his disposal. In fact, what prevents many drivers familiar with horses from becoming satisfactory motor drivers is, in the first place, mere prejudice, and in the second place a most exaggerated idea of the difficulties involved. The cabmen who overcome these prejudices, and who are boldly willing to grasp the nettle of learning a new but not difficult task, are those that will survive, and may look forward to a future of comfort and prosperity. Those who let their prejudices, and an exaggerated notion of the difficulties involved in the new departure, stand in their way, will be but too likely to suffer from the operation of the remorseless law of nature, which ensures that those who adapt themselves to circumstances shall survive, but that the unfit shall perish.

The Cab Drivers' Union is at any rate recognising the interests of the men to the fullest possible extent. It is not only arranging to co-operate most cordially with a Motor Cab Company which it is proposed to form, but has arranged for those cabmen who desire to do so, to become shareholders in the new concern, and thus to some extent to be their own owners and masters.

For the Sake of Beauty.

AN agitation is being started by various individuals and organisations, headed by the Commons and Footpaths Preservation Society and the Kyrle Society, for the purpose of memorialising the Post Office against the disfigurement of commons and rural districts by the erection of telegraph and telephone wires, particularly the latter. There are, no doubt, beautiful stretches of country over which common rights exist, and over which

the Post Office, with a very doubtful legality, has been erecting the posts and pillars for its wires (for, after all, common rights are not public rights), and very often these erections are decidedly disfiguring. While sympathising with the agitation on the whole, we would, however, be greatly pleased if the agitators, and the Commons Preservation Society in particular, would include the erection of overhead tramway conductors in their schedule of things to be objected to. We have more than once alluded to the shocking way in which historic sites have been quite unnecessarily disfigured in this way. We do not see why the agitation should confine itself to the prevention of future crimes of the same sort. Surely the memorialists might insist on the removal of, at any rate, some of the unsightly disfigurements which have already been erected.

Dissatisfaction with the New Patent Act. Is it Justified?

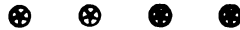
IN discussing the features of the new Patent Act, which came into force on the 1st of January last, in our number of October 29th, 1904, we pointed out that whatever its merits and demerits might be, it would give the *coup de grace* to the "commercial patent." By the "commercial patent," of course, is meant a patent which the patentee well knows to be quite invalid, but which he takes out, trusting in the power of the purse, and the terror which the expenses of litigation involve, to frighten people either into paying him royalties or refraining from manufacturing an article which they really have a perfect right to manufacture, and use, without let or hindrance. Before the introduction of the present Act, applicants could obtain patents of this kind, in spite of the Patent Office and examiners being perfectly well aware that several previous patents for identically the same thing had been granted. The new Act, it will be remembered, enjoins on the Comptroller of the Patent Office (that is, of course, to say his staff of examiners), to make a search, and if the results of the search disclose similar inventions to that for which a patent is claimed, the applicant will be notified, and may amend his specification so as not to conflict with the previous patents. If he refuses to do this, or fails to do it to the satisfaction of the Comptroller, the Comptroller is empowered to insert a reference, and in certain cases it is thought that this reference will effectively prevent commercial dealings with an invalid patent. A doctor was once asked whether he disapproved of children's parties (on the ground presumably of their being pernicious to the children's health), and cynically replied, "On the contrary, I live by them." There are patent agents whose attitude to the commercial patent is not dissimilar. Accordingly an agitation is being got up, and inventors and others are being asked to sign a petition, requesting that the rules may be amended so that the reference may be inserted by the patentee himself, and not bear the invidious distinction of appearing to have been insisted on by the Comptroller. Failing success in this direction, it is proposed to agitate for a short amending Act. It is very questionable, however, whether all this fuss is needed. It would seem that the Comptroller has, at present, power to allow such a reference if he wishes. Next to providing inventors with a search, one of the chief merits of the new Act consists in the blow it aims at the "commercial" patent. We should not like to see it tampered with in such a way as to deprive it of this, its principal beneficial feature.

THE OLYMPIA EXHIBITION OF 1905.

THE Society of Motor Manufacturers and Traders' third International Automobile Exhibition is the first motor car show to be held in Olympia, and already it may be said—although it only opened to the public on Friday of this week—that its success, which has never been in doubt for a moment, is unquestionably assured. It possesses features which distinguish it from any Automobile Exhibition that has previously been known, for it is not only larger than any show of self-propelled locomotion that has ever been held in this country before, but it further has the great advantage of being situated almost in the heart of the Metropolis. As showing the enormous importance which manufacturers have attached to this Show, it may be mentioned that although there are nearly 250 stands, which completely fill all the available space in the main hall, the annex and the galleries, yet all the available space was disposed of a considerable time ago, as many firms who failed to make early application for space have found to their cost. In many cases, however, arrangements have been made with other stall-holders, by which some late comers are not entirely excluded, so that the Exhibition is in every way thoroughly representative of the industry, and the majority of important manufacturers are in evidence there.

It is particularly satisfactory to feel sure that, at this English exhibition—even though we have no building in London that can compare with the Grand Palais in Paris—visitors will certainly not come to the conclusion that there is comparatively little of real novelty, or be disappointed at the sameness of the various exhibits, for not only is there less tendency amongst British manufacturers to stick so closely to orthodox lines in their designs, but the more comprehensive demands made by the English market have resulted in inducing foreign, as well as English, builders to bring before the notice of the visitors a wider range of different kinds of car. At the Paris Exhibition, for instance, the smaller powered cars, and those of really low price, and commercial vehicles generally, were very poorly represented, whereas at Olympia everything in the way of pleasure cars, and a remarkably complete selection of heavy vehicles, are to be found. In other words, the business man, who has been looking forward to the Show in the hopes of finding something to reduce the cost of transit of his goods, and the man who is looking for a small reliable car, will be under no inclination to feel, when they pay their visits to Olympia, that they must have strayed into the wealthiest society in the country, since the majority of the exhibits can only appeal to the pockets of the very well-to-do. As might be expected also, the exhibits in the motor boat department conclusively prove the great advances that have been made in this direction, during the past year.

Although it is easy to state in advance—and it is, moreover, unquestionably true—that all the most recent types of car design, and all the most modern advances that have been made in automobile engineering, are displayed at this great Show, yet it is quite a different matter to deal adequately with the exhibits at this early date, or to give our readers the exact kind of information they require. This, however, is what we have, this year, in part at least, attempted to do. Needless to say, we have fully realised the futility of anything in the nature of what sometimes passes muster for a "forecast," since, after all, the Official Exhibition Catalogue ought, if properly compiled, to reflect the general data that is available by post from manufacturers and agents concerning the exhibits that they intend to display. Further than this, there is apparently only too great a tendency for the need that is felt for further knowledge to be supplied, in such "forecasts," by a mixture of imagination and inaccuracy in about equal proportions. Believing that what is really most required by our readers, at the present time, is something which will tell them what are the additions, improvements and developments which they will find interesting, and that this data is what will be of real use to them before visiting, and while at, the Show, our technical staff has, during the past few weeks, made a tour of the principal works, and otherwise devoted their careful attention to such of the new models as has been possible, with the result that we are able this week to give quite a number of well-considered and illustrated descriptions of cars that are sure to attract their attention during their visit. It would, in any case, be obviously impossible, in a single number of this journal, to deal in this way with each and every stall, so that the mere fact that many makers' new models were insufficiently advanced to permit of this being done does not materially affect the result. We trust that our policy of attempting to do a few things thoroughly, rather than to adopt the easier course of entering into competition with the compilers of the Exhibition catalogue, will meet with the general approval of our readers. We only regret that we are unable to include in the present number many other similar separate articles, which have unavoidably been held over till next week, only because there is a limit to our space.



THE 1905 DAIMLER CARS.

NOTHING could give greater confidence, as to the progress which is being made in the automobile industry in this country, than a visit to the Daimler works in Coventry, for not only are the already existing shops full of cars in various stages of manufacture, but the works are, once more, being very considerably increased in size, in order to enable the company to cope with the orders already on their books, and the business which they have good reason to anticipate during the forthcoming year. Although—impossible to say because—they have decided to restrict their energies to the production of what is practically a single type of vehicle, they have found it necessary to make such extensions as will enable them to turn out as many as nine cars a week, the magnitude of which task can well

be imagined when it is realised that their lowest-powered car has a 28-36 h.p. engine. Needless to state, the manufacturing facilities of this concern are of a thoroughly up-to-date and high order, for the reliability and durability of the Daimler vehicles is too well-known already for it to be necessary to refer to the workmanship and finish of all the parts. The 1905 standard model has a wheel-base of 8 ft. 8 in., a track of 4 ft. 3 in., and, with its 5-seated body, weighs approximately 18 cwt. All the familiar special Daimler features have been retained, but, in addition, several important improvements have been added. Although the chassis is primarily intended for taking the 28-36-h.p. engine, yet it has been designed in such a way that a new 30-40-h.p. engine can be substituted if required.

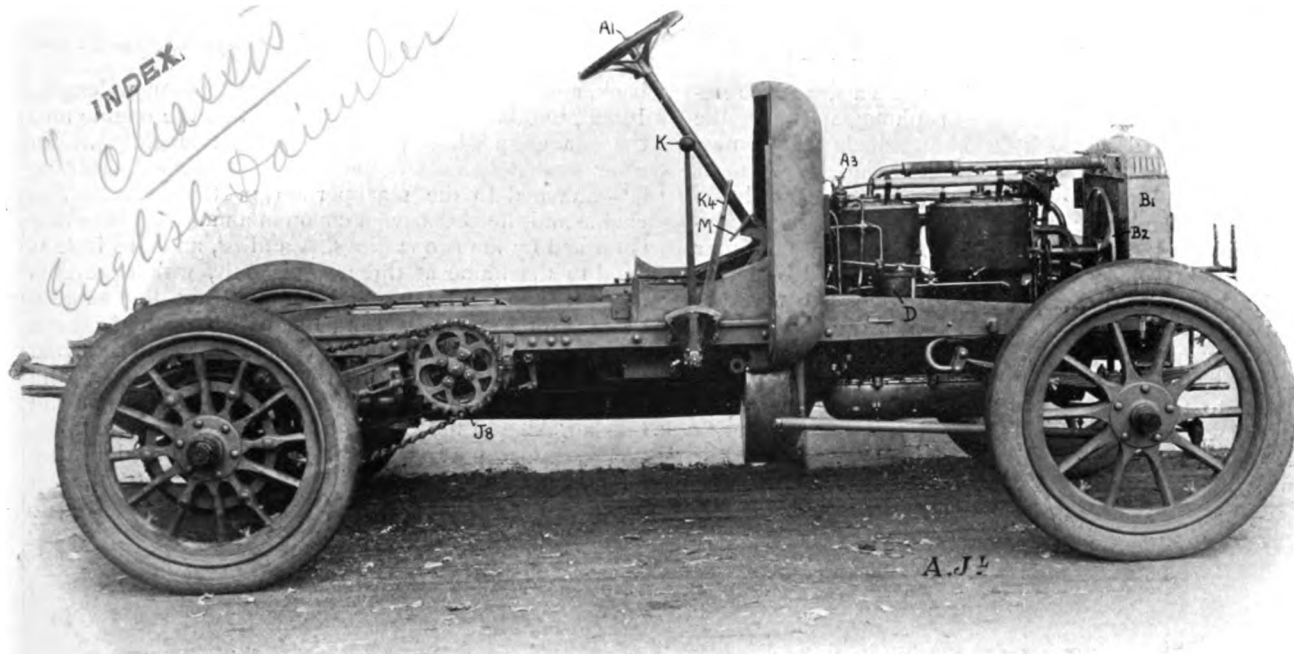


Fig. 1.—Side view of the 1905 28-36-h.p. Daimler Chassis, which has an 8 ft. 8 in. wheel base, and has been improved in simplicity, efficiency, and accessibility in comparison with last year's models.

The usual engine, which is practically unaltered since last year, and develops, it will be remembered, 28-h.p. at 750 revs. per min., has a bore and stroke of 110 mm. and 150 mm. respectively, and the larger engine, which has been designed on almost precisely similar lines, develops 30-b.h.p. at 650 revs. per min., with cylinders having a bore of 124 mm. and a stroke of 150 mm.

No attempt has been made, in the new model, to secure "selling points" merely for appealing to the popular imagination, but the improvements that have been made are aimed at simplifying the design, improving the efficiency of transmission, and in rendering all parts even more accessible than they have hitherto been. To these ends, a single-lever control has been adopted for the engine, ball-bearings have been introduced throughout the transmission-gear and the road-wheels, improved forms of axles are employed, a stronger and

neater type of steering-head has been designed, the engine-base has been rendered detachable without disturbing the crank-shaft, and improvements have been made to facilitate the partial or complete removal of the bonnet.

The new chassis is shown from the off-side, and from above, respectively, in Figs. 1 and 2. The standard bodies that are fitted to it are as usual arranged with hinges at the back, so that they can be lifted up out of the way when required, and they have the emergency brake-lever fitted neatly into the seat, close up alongside the driver.

The company are also supplying cars of the same power, having a 10 ft. wheel base and others with an even longer frame, giving an 11 ft. wheel base as well, but these have the same axles and springs as on last year's models, and ball-bearings are only used for the gear-box.

(To be continued.)

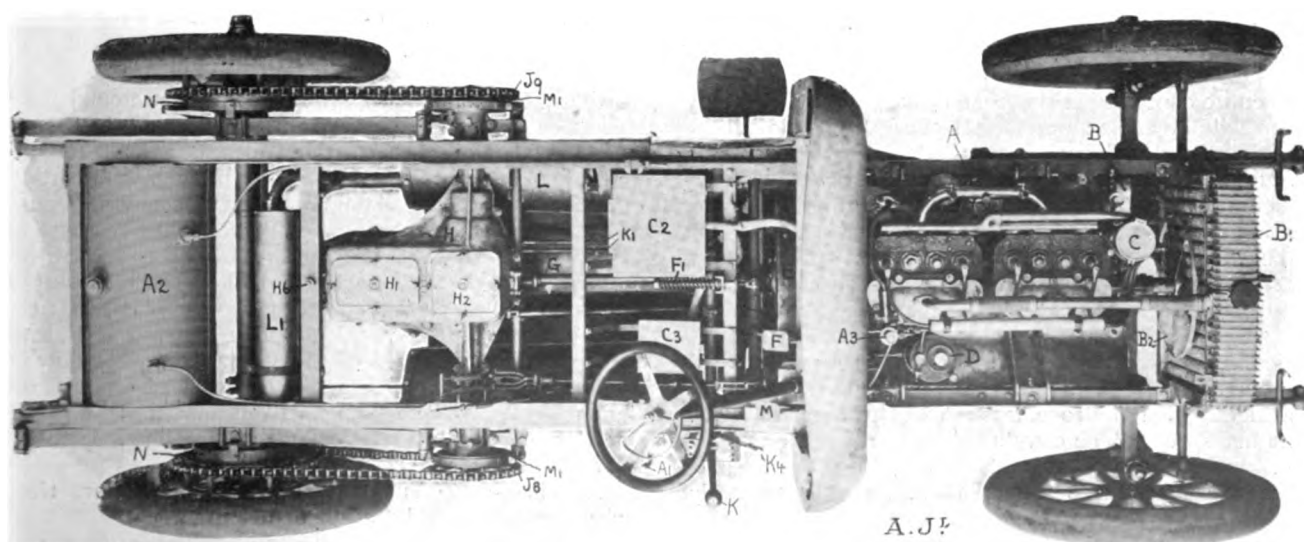


Fig. 2.—View from above of the 28-36-h.p. Daimler Chassis, showing the whole of the Driving and Controlling Mechanism.

THE 6-H.P. SIDDELEY LIGHT CAR.

WE are now able to give full particulars, and to reproduce a very complete set of photographs, of the extremely well designed little 6-h.p. vehicle that is now being put on the market by the Siddeley Autocar Company, and was, it will be remembered, first shown publicly by the Wolseley Company—who are the manufacturers—at the recent Paris Salon. As we said in our report of that show, this new car is totally different in design from the very popular little model known as the "Little Siddeley" which has done so extremely well in all the various events during the past year, for it has a single-cylinder *vertical* engine, and the power is transmitted to the axle by a propeller-shaft instead of by a chain. Although it, therefore, conforms far more with orthodox practice, there is much in its design that is novel, and—like its predecessors—it bears throughout

back, and that the front springs are also of ample length. It will, too, be immediately noticed that the engine and the change-speed-gear, together, form a single unit, in front, so that there is nothing—except the exhaust-box, C'—attached to the rear portion of the frame. The engine and the gear have a common aluminium base that is formed by the two castings, A and A', and this base is fixed to the frame at three points only, which prevents any twisting of the frame from affecting the smooth running of the mechanism; the base is bolted, at the back, to the two side members of the frame, and is carried centrally by a trunnion in front, as seen in Fig. 3; the trunnion is concentric with the crank-shaft, it rides in the bracket, A', and the starting-handle projects inside it.

The upper portion of the engine is formed by the aluminium casting, A², which not only constitutes the top

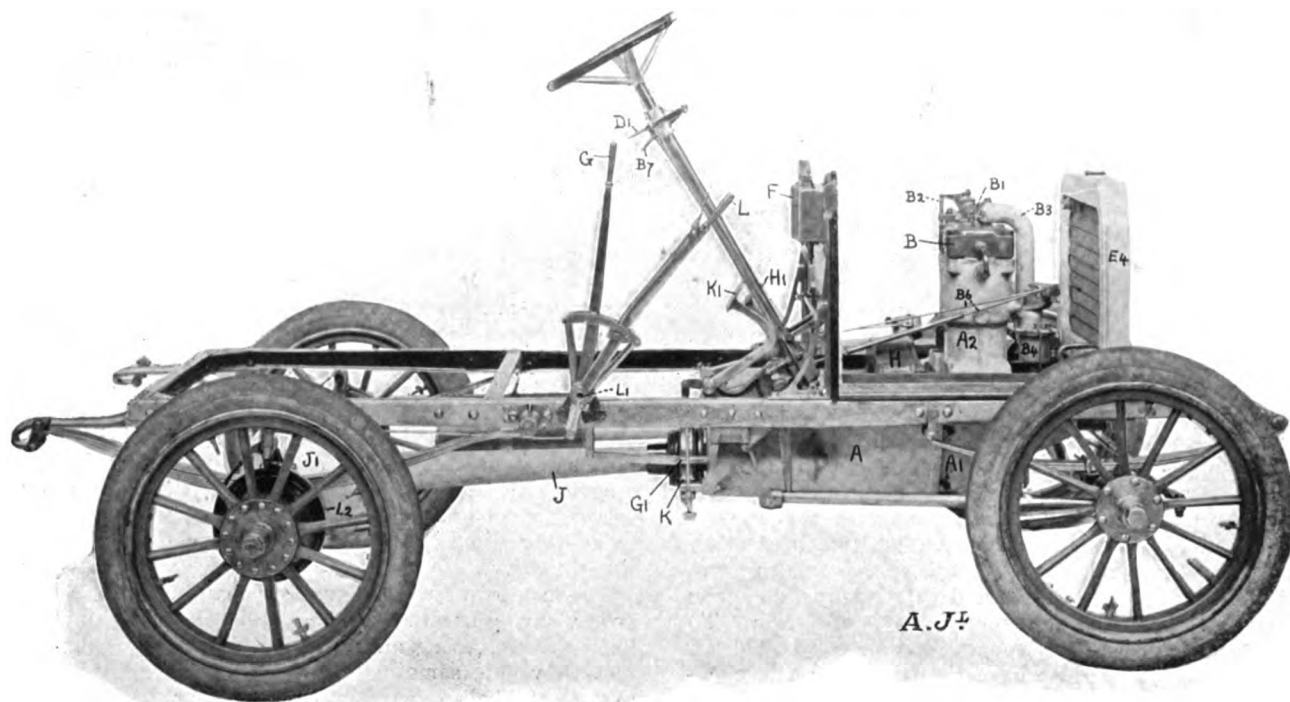


Fig. 1.—Side view of the 6-h.p. Siddeley Chassis, showing the simple arrangement of the well protected Driving Mechanism.

its entire construction the same imprint of original study and skilful manufacture that is so characteristic of all the Wolseley and Siddeley cars. Perhaps its most striking feature, apart from the efficiency ensured by the arrangement of the transmission mechanism and the great simplicity of the car as a whole, is the way in which the entire machinery is protected from dust and dirt, at every point between the engine at one end, and the hubs of the driving-wheels at the other end. And yet these casings are far from rendering the mechanism inaccessible. The engine practically gives the same power as the horizontal model on the "Baby," for although it has a slightly shorter stroke, it is intended to run at a higher normal speed. The car, though primarily a three-seater, in which there are two seats at the back, and a single seat in front, can also be supplied with a two-seated body.

From our illustrations, it will be seen that the pressed-steel frame is carried upon long outside springs at the

of the crank-chamber, but forms the jacket around the cylinders. Fitting in between this casting and the base, is a large aluminium sheet, which does not actually touch the side members of the frame, but projects sufficiently near them to exclude all mud and dust that may rise from beneath. The sheet extends along, around the combined clutch and flywheel, up to the gear-box, and thus there is no part of the engine, the clutch, or the gear, that is not thoroughly protected. The cylinder itself is, in accordance with the invariable practice of the Wolseley Company, formed by a cast-iron liner that fits down inside the jacket: and the cylinder-head, B—which is independently jacketed—is held down in place, with a metal-to-metal joint between it and the liner, by four studs fixed to the jacket casting.

The inlet-valve is mounted immediately above the exhaust-valve, and both are operated by cams on the same half-speed-shaft, inside the crank-chamber; the inlet-

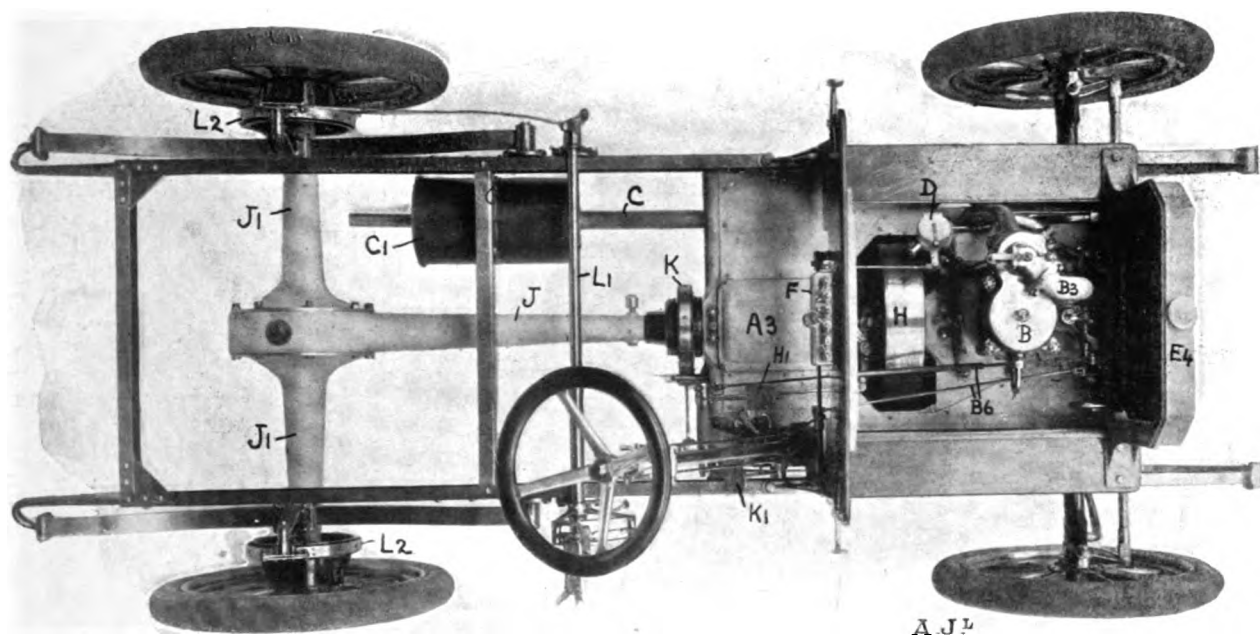


Fig. 2.—View of the 6-h.p. Siddeley Chassis, from above, showing the general arrangement of the Engine, Clutch, Gear-Box, and Live-Rear-Axle.

valve is held down by the induction-pipe-fitting, B¹, and is actuated through a small rock-shaft by the vertical push-rod, B². The cams do not act direct upon the push-rods, but there are small pivoted levers interposed between them. For rendering starting easy, there is also a sliding half-compression-cam upon the cam-shaft, which lifts the exhaust-valve during the earlier part of the compression-stroke, when the small handle, C², in front of the car is pulled forward. The cylinder has a bore of $4\frac{1}{2}$ ins., with a stroke of $4\frac{1}{2}$ ins., and, although the normal speed of the engine is about 850 or 900 revs. per min., yet it is quite capable of running up to twice the speed if allowed to do so.

The carburetor, B⁴, is conveniently placed, as seen in the illustrations, and it has the new type of "Wolsley" throttle-valve, B⁵, fitted to it, this throttle-valve being independently operated by the two rods, B⁶, one of which allows it to be controlled by the hand lever, B⁷, on the steering-pillar, and the other causes it to be automatically closed when the brake-

pedal, K, is depressed. The valve is arranged in such a way as to maintain an approximately constant richness of mixture, for it simultaneously regulates the air-supply, when varying the power and speed of the engine. The petrol tank is fixed to the dashboard beneath the bonnet.

Our illustrations show the position of the commutator, D, and of the circulating-pump, E, both of which are very accessible. The former is driven by bevel-gearing off the cam-shaft, and the latter is mounted direct on the front end of that shaft. The ignition system is of the usual high-tension type, and is "timed" by the lever, D¹, on the steering-pillar—the ignition-plug fitting horizontally into the valve-chamber, while the pump is connected up in the usual way with the finned-tube radiator, E⁴, that forms the front of the bonnet, and with the cylinder-jackets, by the pipes, E¹, E², and E³. The lubricator, F, on the dashboard has six feeds, and it supplies oil to the engine and the gear-box.

The first motion-shaft of the change-speed-gear is in

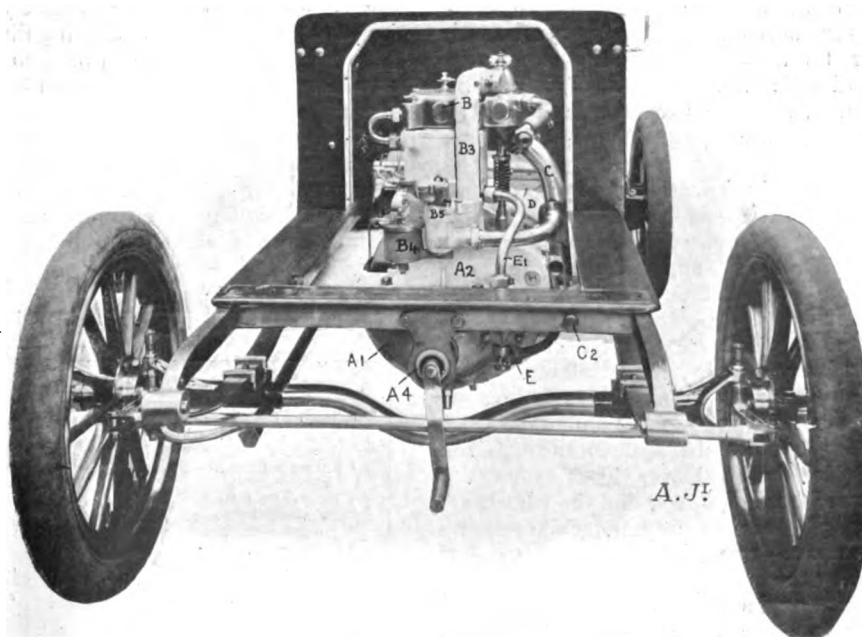
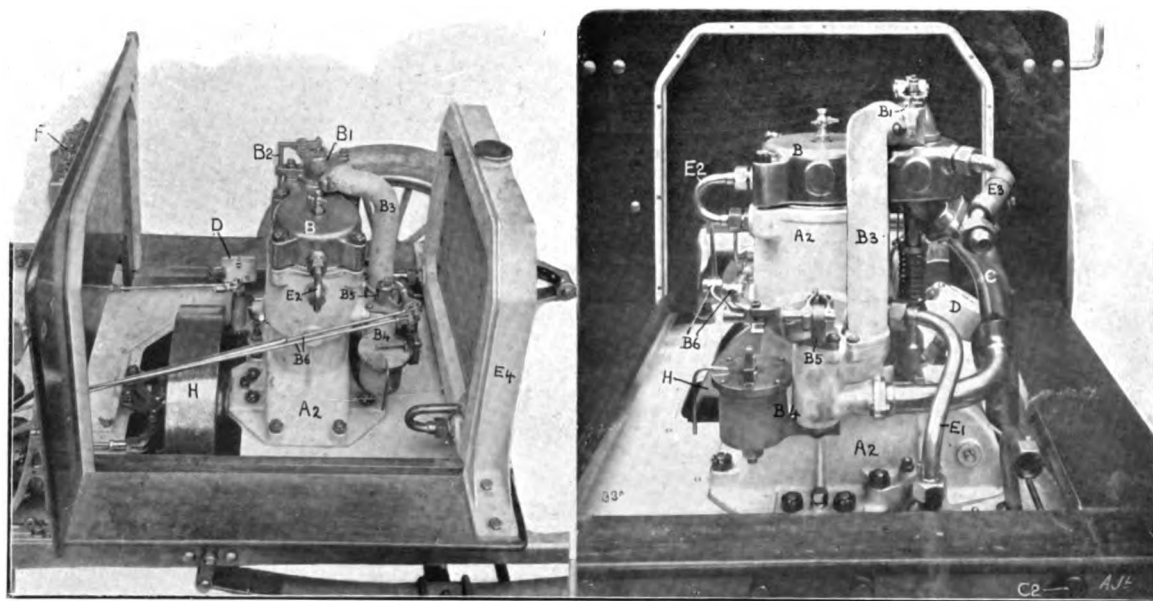


Fig. 3.—Front view of the 6-h.p. Siddeley Chassis, with the Radiator removed to show the Engine. In this view the Central Trunnion that supports the Engine and Gear Casing is prominent.



Figs. 4 and 5.—The 6-h.p. Siddeley Chassis. Views of the Engine, from the Right Side and in Front.

line with the crank-shaft, and between them is introduced an internal-cone clutch, that lies inside the fly-wheel, H, and is operated by the clutch pedal, H¹. The second-motion-shaft is placed immediately beneath the first-motion-shaft, so that the sliding wheels on the former, as well as the fixed wheels on the latter, are readily accessible through the large detachable cover-plate, A³. Both shafts—as also the propeller-shaft and both axles—are fitted with ball-bearings, and the gear is operated from the hand-lever, G, by a very simple and direct mechanism of which the sliding rod, G¹ (passing through the end of the gear-box), forms the chief part. Three forward speeds and a “reverse” are available, and, owing to its low level, the angularity of the second-motion-shaft with the propeller-shaft is less than usual.

The arrangement of the live-axle, and of the propeller-shaft driving it, constitutes one of the most important features of the car, for these two parts are completely enclosed in one rigid aluminium casing that is formed by the central casting, J, and the two side castings, J¹. By this construction, the propeller-shaft requires a universal joint at its front end only, and the casting, J, forms a very effective radius-rod and “torque”-rod to relieve the side-springs of all strain, while it further renders self-lubricating the bearings and gear-wheels contained inside it, and allows for the free play of the frame. The differential-gear is as usual driven by bevel wheels.

Very effective brakes, which are operated in the same way as on the majority of cars, are available. The foot-brake, K—immediately behind the gear-box—is controlled by the pedal, K¹, and the two hub brakes, L², are compensated by a cable that passes through the rock-shaft, L¹, to which the hand-lever, I¹, is secured.

The car has a wheel-base of 6 feet, and the wheels are fitted with 28 by 3½ pneumatic tyres, while—as we have already pointed out—smooth running and comfort have been ensured by the employment of extremely long springs. The regulating levers and pedals render the vehicle quite easy to control, for the two side levers, the two levers on the steering pillar, and the two pedals, alone require manipulation, and they are conveniently placed for this purpose. The speed of

the engine—and therefore that of the car under normal conditions (since it can usually be driven on the “top” speed)—is varied by the throttle-lever, B¹, and by the “timing” lever, D¹. At any time, the car can be slowed up, or even stopped, by pressing down upon the brake-pedal, K¹—since this also acts upon the throttle-valve—while, with the other foot, the main-clutch can be instantly disconnected, by depressing the pedal, H¹. The single-lever, G, permits either of the three forward-speeds or the “reverse” to be brought into play, and the brake-lever, L, is merely required in case of emergency, or for holding the car stationary when left standing.

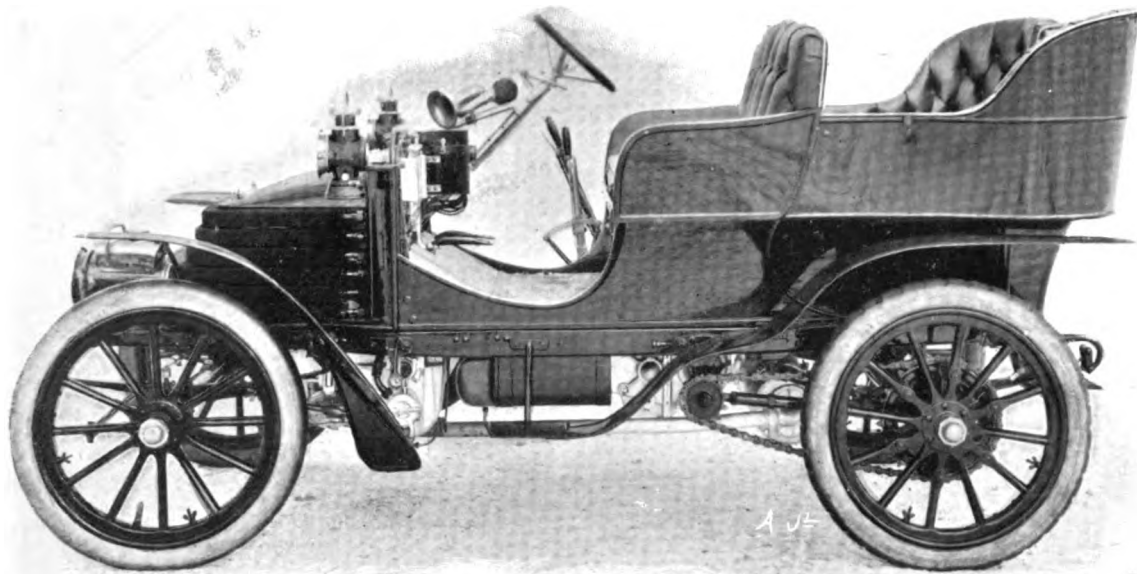
Such, then, are the more important details of construction of this interesting vehicle, which, it is safe to say, is destined to become extremely popular during the coming year. It has, at any rate, every chance of becoming so—so far as can be seen in advance—for not only is the chassis extremely well built in every respect, but the simplicity of control and accessibility of all parts are sure to appeal to that very large class of purchasers for whom it has been specially built. We hope before long to give it a practical trial on the road, and shall doubtless also have many other opportunities of speaking further as to its actual capabilities in practice.

Table of Reference Letters for the 6-h.p. Siddeley Car Illustrations.

A	Base casting for gear-box and flywheel.	E ¹	Delivery pipe to jacket.
A ¹	Base casting for crank-chamber.	E ²	Connecting-pipe to cylinder-head.
A ²	Jacket casting.	E ³	Return pipe to radiator.
A ³	Detachable gear-box lid.	E ⁴	Radiator.
B	Front trunnion bracket.	E ⁵	Lubricator.
B ¹	Cylinder head.	E ⁶	Change-speed-lever.
B ²	Inlet-valve fitting.	E ⁷	Sliding rod in gear-box.
B ³	Push-rod for inlet-valve.	H	Flywheel.
B ⁴	Induction-pipe.	H ¹	Clutch-pedal.
B ⁵	Carburettor.	J	Casting containing propeller-shaft.
B ⁶	Throttle-valve.	J ¹	Castings containing “live” axle shafts.
B ⁷	Rods controlling throttle-valve.	K	Foot-operated brake.
C	Throttle-lever.	K ¹	Brake-pedal.
C ¹	Exhaust-pipe.	L	Brake-lever.
C ²	Exhaust-box.	L ¹	Transverse rock-tube.
C ³	Half-compression handle.	L ²	Hub brakes.
D	Commutator.		
D ¹	Timing lever.		
E	Circulating pump.		

THE NEW 8-H.P. WOLSELEY CAR.

INDEX



The new 8-h.p. Wolseley Car—which has a Horizontal Twin-Cylinder Engine—fitted with Tonneau Body.

AMONGST the many new vehicles of various kinds which are being manufactured by the Wolseley Company in their ever-extending, and already huge, works in Birmingham, none could be more thoroughly successful in its own particular sphere than the 8-h.p. model. Speaking from practical experience, we can say without hesitation, that it is not only one of the most capable and handy four-seated cars of its size, but that it is also about the most comfortable and smooth running twin-cylinder vehicle in which we have ridden. Those who are still prejudiced against horizontal engines would be compelled to admit that there is much indeed to be said for them, after they had become acquainted with this model, for the engine practically runs without any appreciable

vibration, leaves nothing to be desired in the way of accessibility, and is, moreover, extremely flexible. Both the bore and the stroke of the cylinders are 4 in., and the actual power developed is about 9 h.p. at 900 revs. per min. The general appearance of the complete car is well shown in the first of our illustrations, where it will be noticed that the chassis is sufficiently long to accommodate a tonneau body, and at the same time to leave plenty of space between the dash and the driver's seat to ensure his comfort. The actual space available behind the dash-board is 5 ft. 11 ins. long by 2 ft. 10 ins. wide, and the overhang of the frame behind the rear axle is 13 ins. The car has a wheel-base of 6 ft. 11 ins., and a track of 4 ft. 1 ins., while the wheels have 32 ins. by 3½ ins.

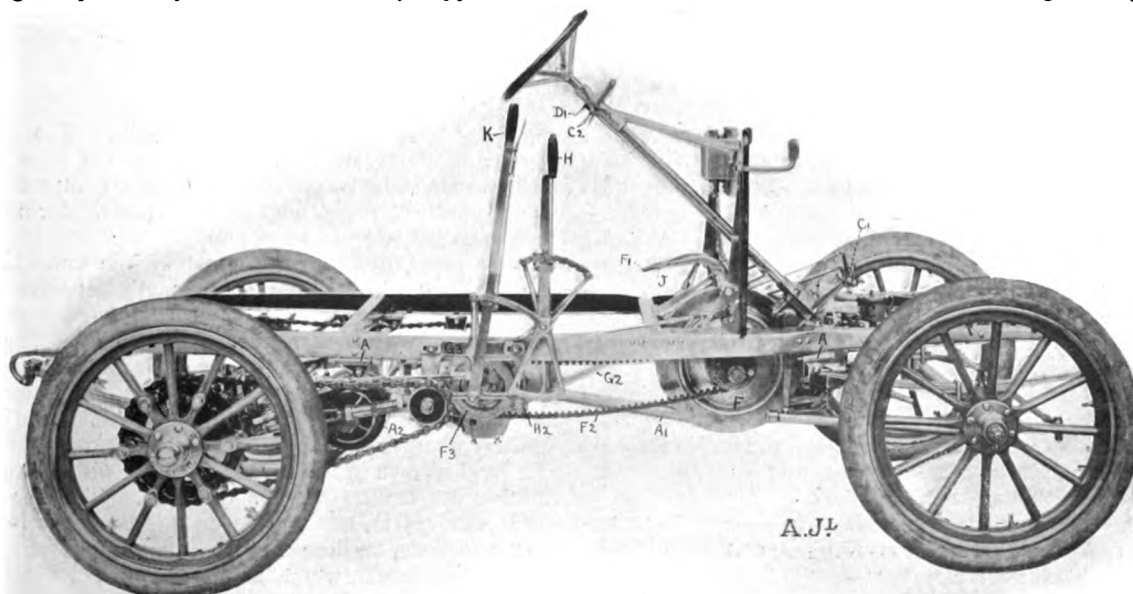


Fig. 1.—Side view of the 8-h.p. Wolseley Chassis, fitted complete with its 32 by 3½ in. pneumatic tyres.

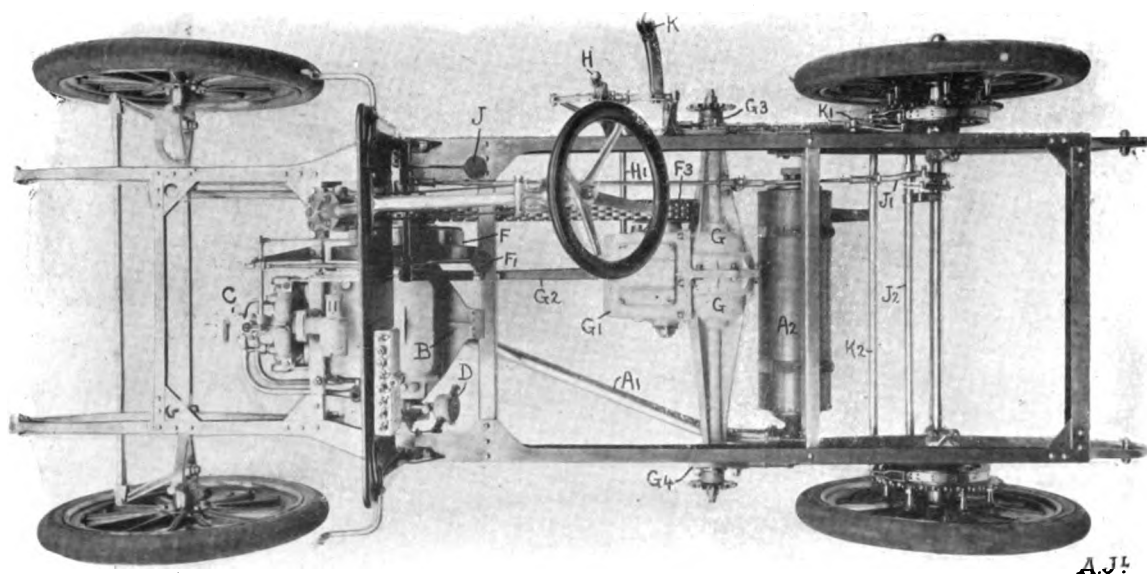


Fig. 2.—View of the 8-h.p. Wolseley Chassis from above, showing the whole of the Driving Mechanism—with the exception of the Side-Chains, which have been removed.

pneumatic tyres fitted to them. The springs are of ample length to ensure easy running, those at the back being 36 ins., and those in front 33 ins. long.

Two views of the complete chassis are given in Figs. 1 and 2, the former showing it from the off side, and the latter from above. From these illustrations, the very noticeable absence of all complication will be observed. Although it will also be recognised that the general arrangement of the parts follows closely upon previous Wolseley practice, yet the detailed description which we are enabled to give of the entire construction will show that many improvements which, small as some of them may be in themselves, are nevertheless of great importance, have been incorporated in this latest production.

The main-frame is constructed of pressed steel, with a tapering channel cross-section, and its side members curve inwards in front of the dash to ensure a wide steering-lock. The front springs project forward considerably in front of the bonnet, the sides of which are—as usual—formed by the very effective finned-tube radiator that is already so well known, so that the front axle is well forward, and plenty of weight is taken upon the rear wheels. Both the axles are solid forgings, the rear-axle being turned circular, and the front axle, which has bifurcated ends to form the steering-heads, having an I cross-section. The road-wheels are of the artillery type, and run on ball-bearings.

(To be continued.)



NAPIER CARS FOR 1905.

THIS widely-known firm of English manufacturers are laying themselves out to supply four distinct types of touring vehicles during the present year, apart from the new 18-h.p. landaulette which we illustrated last week. These are respectively of 40-h.p., 30-h.p., 24-h.p. and 18-h.p., of which the first and last have not hitherto been publicly exhibited. The 30-h.p. vehicle is the well-known 6-cylinder model that was introduced last year, and is, it will be remembered, of the chain-driven type with 4 in. by 4 in. cylinders, while the 24-h.p. chassis has also been a standard model for some time, and it, too, is a chain-driven car; the 24-h.p. engine has its cylinders formed by cast-iron liners, which are forced into the aluminium jacket-casting, and the bore and stroke respectively are 4 in. and 6 in.

Of the new models, the 40-h.p. type embodies the greatest departure from previous Napier practice—leaving out of consideration racing cars—for it has (substituted for side chains) a “live” rear-axle, that is driven by a propeller-shaft. The 4-cylinder engine is of similar design to the 24-h.p. model above referred to, and its

normal speed is 1,000 revs. per min. The general design of the chassis is modelled on the lines of the 20-h.p. car, which attracted so much attention at the Bexhill Meeting, and other trials, during the past season, and it has—like all the other Napier cars—a metal-to-metal cone clutch of the same kind as that which we dealt with at some length last week. The propeller-shaft has universal joints at both ends, and the road wheels are fitted in such a way that the weight of the vehicle is taken on stationary tubular trunnions, instead of by the “live” shafts. We understand that the engine is capable of giving fully 50-h.p. on the brake, and events have already proved that this powerful vehicle can hold its own in the matter of speed with almost any touring car that is now on the road. The wheels are fitted with 34 in. tyres, those on the back wheels being 120 mm. wide, and those in front 90 mm.

The 18-h.p. car, which is the car turned out by the Napier firm to suit those desiring one at a moderate price, is similar in general respects to their earlier 15-h.p. model, of which we gave a full description in our

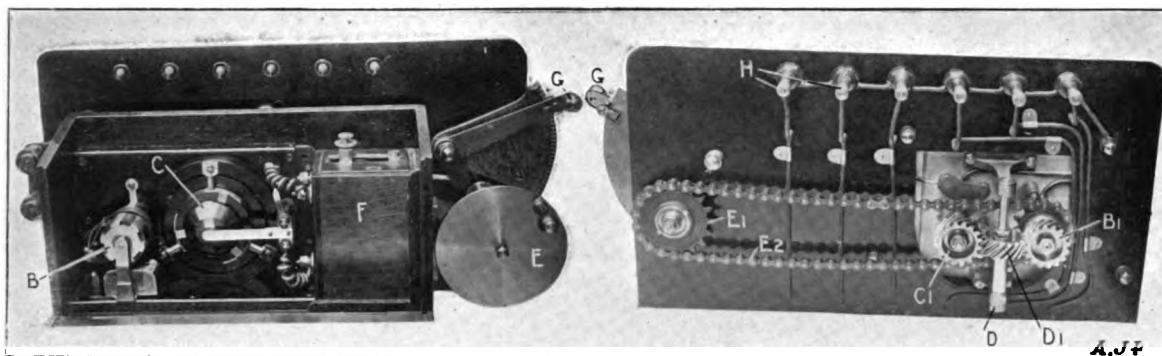


Fig. 1.—Views, from in front and behind, of the working model, showing the arrangement of the Napier Synchronised Ignition System.

columns, for it is of the chain-driven type, has an armoured-wood frame, and the engine has its four cylinders cast in pairs, with the inlet and the exhaust-valves on opposite sides. Every effort has been made in its design to combine efficiency with light weight, so that the car, although provided with a roomy side-entrance body, shall not only be of a comparatively low initial cost, but inexpensive also in upkeep. Like all the larger vehicles, it is fitted with the special automatic auxiliary-air regulator, that employs the pressure in the water system for maintaining an approximately constant richness of mixture, and also with the Napier synchronised ignition system.

Our illustrations show some interesting parts of the latest Napier cars, as also the working model that is being shown at Olympia to demonstrate the action of the maker's ignition apparatus. This latter is seen from both sides in Fig. 1, where it will be noticed that the low-tension commutator, B, and the high-tension distributor, C, are both driven simultaneously from the engine, by the vertical shaft, D, through the spiral gear-wheels, B¹ and C¹, which mesh with the wheel, D¹. On this model the disc, E, is fitted with a handle, so that the ignition apparatus can be worked by hand, but usually the spindle to which the disc is attached is that which

forms part of the mechanical lubricator. In actual practice, it will therefore be seen that the lubricator is driven by the chain, E², which passes round the sprocket, E¹. The single-trembler-coil, F, forms a part of this compact apparatus, and the "timing" lever, G, is, on this model, arranged close up to it. The six ignition-plugs, H, are also fitted into the base board, to permit the sparks to be seen by visitors to Olympia.

In Fig. 3, one of the 6-cylinder crank-shafts, as also the cam-shaft for this same engine, are depicted, both of which are accurately machined up from solid forgings. It will be noticed that bearings, A, are formed for the shaft outside each *pair* of crank-pins, and that the six cranks, A¹, A², A³, A⁴, A⁵, and A⁶, are set in such a way that the two inner, the two intermediate, and the two outer are in line, respectively. Fig. 2 shows the combined circulating-pump and centrifugal engine-governor, which, it will be noticed, are mounted on the same spindle, and are driven by a chain; while in Fig. 3 is shown one of the differential countershafts that is used on the 18-h.p. vehicles, with the brake-drum, that lies just outside the gear-box, fixed in place upon the sleeve; the differential-gear, it will be noticed, is of the spur-wheel type, and the bearing surfaces on each side of it are of large dimensions.

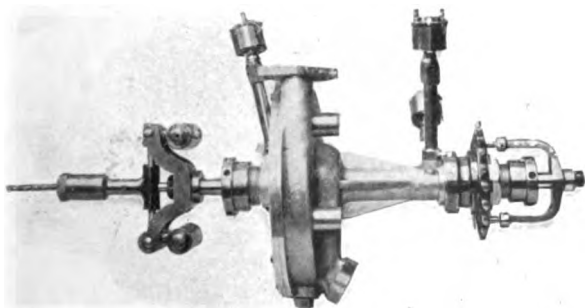


Fig. 2.—The Napier Combined Circulating-Pump and Governor, which form an independent unit and are driven by a chain.

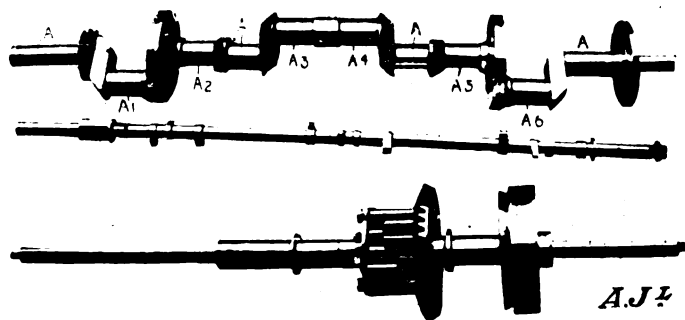
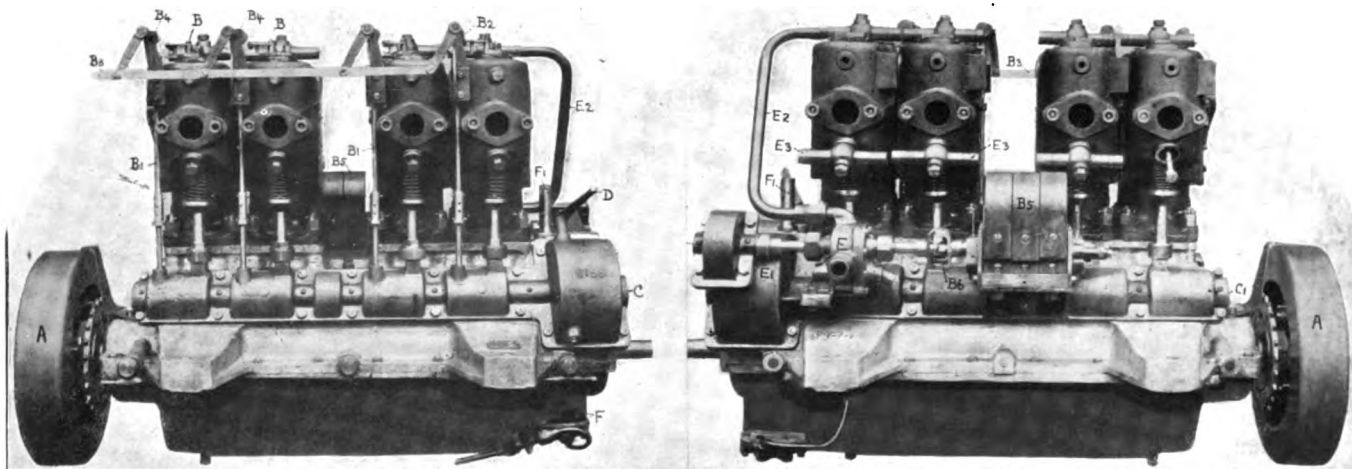


Fig. 3.—Views of a 6-Cylinder Napier Crank-Shaft, of a Cam-shaft for the same 30-h.p. Engine, and of the Differential Countershaft removed from the Gear-Box of an 18-h.p. Napier Car.

THE 24-H.P. THORNYCROFT CAR.



Figs. 1 and 2.—Views of the new 24-h.p. Thornycroft Engine, from the Right and the Left-Hand sides, respectively; the former shows the Inlet-Valve and Ignition Mechanisms, and the latter shows the Exhaust-Valve-Gear, the Pump and the Magneto.

SEVERAL new features have been embodied in the 1905 touring vehicle which Messrs. Thornycroft and Co. have now put upon the market, and it may safely be said that it is a car which will maintain the reputation of this well-known firm of engineers. The general design of the chassis is much the same as that of their 20-h.p. vehicle, for it is of the live-axle type, is fitted with a transverse rear-spring in addition to the ordinary side-springs, has side radius-rods as well as a central torque-rod, and the pressed steel frame has a sloping under-frame, in order to reduce the angularity between the propeller-shaft and the crank-shaft. It has a 10 ft. 4 in. wheel-base, with a track of 4 ft. 4 in., and is considerably more speedy than the 20-h.p. car.

Most important of all is the new engine, of which three views are given in the accompanying illustrations, for it is of a totally different design from their previous types, and has many important characteristics. Its cylinders have a bore of $4\frac{1}{4}$ in., with a stroke of 5 in., and it is capable of developing about 30-h.p. at a speed of 1,000 revs. per min. Each cylinder is a separate casting that has its valves arranged on opposite sides, and there are low-tension igniters, B, fitted above the inlet-valves, instead of inspection-plugs; the inlet and exhaust-valves are interchangeable. The plugs above the exhaust-valves, as also the igniters, are held down in place by very neat bayonet-socket fittings, that enable them to be removed very quickly, and make a thoroughly gas-tight joint beneath them. The igniters are operated from the same cam-shaft (C) as the inlet-valves, through vertical rods, B¹, which are normally pressed upwards by springs, but are free to slide longitudinally for enabling the "time" of ignition to be varied. Above the vertical rods, B¹, are fitted cams, B², which are connected, as seen, through the brackets, B³, with the operating bar, B³; the cams thus simultaneously "time" all four igniters.

The two cam-shafts, C and C¹, are driven through an intermediate spur-wheel on the shaft, C², from the crank-shaft, and all the gear-wheels—including one on the shaft, C³—are completely enclosed in the crank-chamber castings. Inside the same casing, moreover, is the centrifugal-governor, which is mounted on the shaft, C,

and is connected with the throttle-valve by the projecting lever-arm, D.

The shaft, C³, drives the water-pump, E, and also the magneto, B⁴, both of which are connected with it by flexible couplings, E¹ and B⁴. The pump delivers the water by the pipe, E², into the heads of all four cylinders, and the water is then led back to the radiator through the pipe-fittings, E³, beneath the exhaust-valves. It will be noticed that a very neat form of fixing has been adopted for these pipes, to enable a watertight joint to be quickly made between them and the cylinder-casting.

In order to ensure proper lubrication automatically, at all times, an oil-pump, F, is provided in the base of the crank-chamber, and it circulates the oil over all the bearing surfaces. Its vertical shaft, which is driven by gearing, also projects upward through the oil-tight casing, and, since it is driven at one-half the speed of the crank-shaft, this upper end lends itself conveniently for driving the commutator, when an auxiliary high-tension system of ignition is required. For this purpose, the coupling-sleeve, F¹, is provided, to receive the commutator-shaft, the commutator itself being placed on a level with the top of the cylinders, where it is particularly accessible.

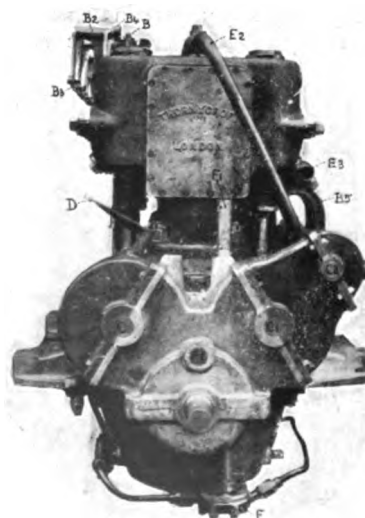


Fig. 3.—Front view of the 24-h.p. Thornycroft Engine, with the Exhaust-Valves on the Right, the Inlet-Valves and Igniters on the Left, and the Oil-Pump Beneath.

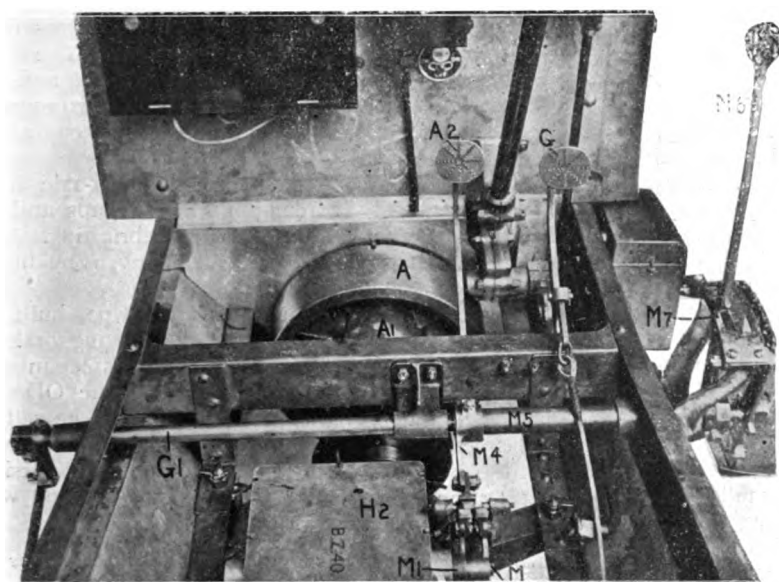


Fig. 4.—View of the Central Portion of the 24-h.p. Thornycroft Chassis, showing the position of the Multiple-Disc Clutch, and the arrangement of the Change-Speed-Gear Mechanism.

The Thornycroft carburettor is rendered "automatic" in much the usual way—by providing it with a spring-controlled auxiliary-air valve—but it differs from most others in that it is sufficiently jacketed to immediately vaporise any excess of petrol that may pass through the jet; extra precautions are also taken to prevent any

flooding. From the experience the makers have had with carburettors, they are of opinion that this matter is of very great importance, and that a certain amount of flooding does usually take place, under certain running conditions, with detrimental effects to the proper running of the car.

The main-clutch employed is of the multiple-disc type, and, as it occupies comparatively little space within the flywheel, there is plenty of room—between its external casing, A^1 , and the rim of the wheel—to provide fan-blades for drawing the air through the radiator. In Fig. 4, which shows the central portion of the chassis, a portion of the clutch, and the clutch-pedal, A^2 , are visible, the pedal being, as usual, placed to the left of the brake-pedal, G .

The new Thornycroft gear-box is shown in Fig. 5, with its large cover-plate, H^2 , removed, and again with the upper portion, H^1 , of the box also removed, while, in the same illustration, the shafts and the gear-wheels are once more seen separately.

One of the chief objects that has been aimed at in its design is to reduce the length of the shafts, as far as possible, between the bearings, and thus to prevent any "springing." The gear is, in a sense, based on the well-known Mercedes pattern, but it differs from it in so many important ways that perhaps the only real resemblance is

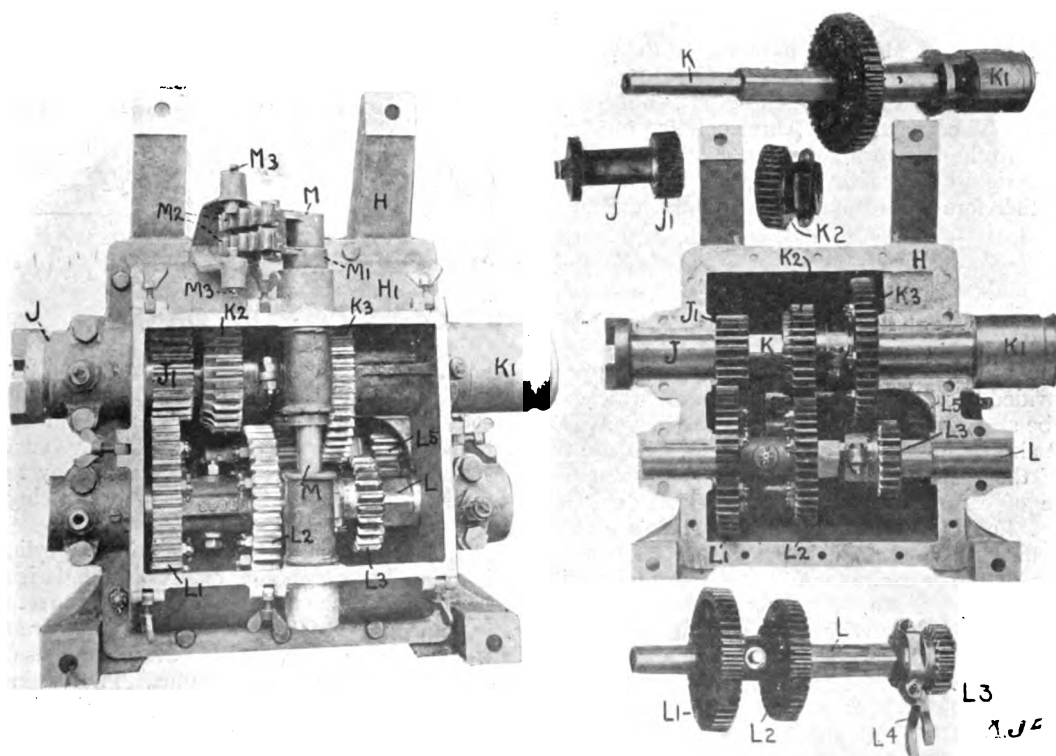


Fig. 5.—The Thornycroft Change-Speed-Gear, showing the Gear-Box from above—with the Inspection-Cover removed, another view in which the Upper Portion of the Gear-Box has also been taken off, and separate views of the Shafts and Gear-Wheels.

the arrangement of the change-speed-lever, M⁶. The "driving" member, which is connected by a flexible coupling with the main-clutch, consists of a hollow-shaft, J, inside which projects the end of the "driven" shaft, K,—for which it forms a bearing. The shaft, J, is solid with the spur-wheel, J¹, and this wheel meshes with the wheel, L¹, on the lay-shaft, L, so that that shaft always revolves—but at a comparatively low speed—even when the direct-through top-speed is in use. Fixed rigidly to the shaft, K, is the low-speed and "reverse" spur-wheel, K³, and, mounted so as to slide freely on a square portion of the same shaft, is the gear-wheel, K². The wheel, K², normally lies in such a position that it neither engages with the wheel, J¹—which it is capable of doing, since it has internal teeth as well as external teeth—nor with the wheel, L², on the lay-shaft, but it can be caused to slide, and to engage with either of those wheels, for it is connected by a fork with the hollow rock-shaft, M¹. The wheel, L², is—like the wheel, L¹—rigidly fixed to the lay-shaft, but the wheel, L³, is capable of sliding longitudinally, and can be brought into mesh with the wheel, K³ (for giving the "first" speed), or with an intermediate pinion, L⁵, for giving the "reverse." The wheel, L³, is, for this purpose, connected by a fork with the rock-shaft, M. The intermediate spur-wheel, L⁵, is fixed to another small lay-shaft, beneath, and on this short shaft is fitted a second spur-wheel, which is caused to slide into mesh, K³, at the same time that the wheel, L³, engages with the wheel, L⁵; the sliding "reverse" pinion is controlled by the fork, L¹, which projects down, as seen, from the sliding-wheel, L³. By this arrangement, it will be noticed that the "first" and "reverse" gears are brought into play by rocking the shaft, M, and that the two higher speeds are introduced by the hollow rock-shaft, M¹. It will further be seen, from Figs. 4 and 5, that the two rock-shafts, M and M¹, are provided with toothed quadrants, M², which are normally held in their neutral positions by spring catches, M³, but can—alternatively—be engaged by a corresponding quadrant that is fixed to the lever arm, M⁴ (Fig. 4). This arm, M⁴, is rendered rigid by the sleeve, M⁵, with the gear-lever, M⁶, and it therefore slides from the one quadrant, M², into

the other, when the hand-lever is moved across from one slot to the other in the quadrant, M⁷. The three forward speeds on this car represent 7½, 20, and 31 miles per hour respectively, when the engine is running at its normal speed, and the "reverse" gear is equivalent to five miles an hour.

The power is transmitted to the live-rear-axle by a propeller-shaft that has cardan-joints at both ends, and the axle is so constructed that it is self-lubricating. The differential-gear, which is, as usual, driven by bevel-wheels, is of the spur-wheel type.

A special double landaulette of this type, built for H.R.H. Princess Christian, as also a shooting brake—designed to carry a party of 10 persons across country—are amongst the Thornycroft exhibits at the Olympia Show. The latter vehicle—which is only geared to 20 miles per hour on the top speed—has solid rubber tyres, the use of which has been rendered feasible owing to the efficiency of the carriage springs with which these vehicles are fitted.

Table of Reference Letters for the Thornycroft Car Illustrations.

A	Fan flywheel.	J	Sleeve driven by engine.
A ¹	Hub containing multiple disc clutch.	J ¹	Gear-wheel fixed to J.
A ²	Clutch-pedal.	K	Gear-shaft driving propeller-shaft.
B	Low-tension igniters.	K ¹	Cardan joint on same.
B ¹	Rods operating igniters.	K ²	Sliding wheel on shaft, K.
B ²	Brackets carrying timing mechanism.	K ³	Low-speed and reverse wheel fixed to K.
B ³	Timing bar.	L	Lay-shaft.
B ⁴	Timing cams.	L ¹	Wheel meshing with wheel, J ¹ .
B ⁵	Magneto.	L ²	Second speed wheel on shaft, L.
B ⁶	Flexible coupling for magneto.	L ³	Sliding first speed wheel on shaft, L.
C	Inlet cam-shaft.	L ⁴	Fork, controlling intermediate reverse wheel.
C ¹	Exhaust cam-shaft.	L ⁵	Intermediate spur-wheel.
C ²	Shaft for intermediate spur-wheel.	M	Shaft controlling first and reverse gears.
C ³	Shaft, driving pump and magneto.	M ¹	Sleeve controlling third and fourth gears.
D	Governor lever.	M ²	Toothed quadrants fixed to M and M ¹ .
E	Circulating pump.	M ³	Spring catches for quadrants, M ² .
F	Flexible coupling for same.	M ⁴	Quadrant arm fixed to sleeve, M ⁵ .
F ¹	Delivery pipe to jacket.	M ⁵	Sleeve connecting M ⁴ with change-speed-lever, M ⁶ .
F ²	Return pipe from jacket.	M ⁶	Change-speed-lever.
F ³	Lubricating pump.	M ⁷	Quadrant.
F ⁴	Coupling for commutator.		
G	Brake-pedal.		
G ¹	Rock-shaft for hand brake.		
H	Lower half of gear-box.		
H ¹	Upper half of same.		
H ²	Lid of gear-box.		



THE 8-H.P. AND 12-H.P. SINGER PETROL CARS.

QUITE one of the sensations at the Olympia Show is being provided by the unique type of vehicle which will not only be shown for the first time by the Singer Company, but also by Messrs. Lea and Francis, who are the owners of the patents under which it is constructed. This type of car was, it will be remembered, exhibited by Messrs. Lea and Francis at the Crystal Palace Show last year, but it was then perhaps in too much of an experimental stage to excite the full attention that it now, at least, deserves. Since then, cars of this kind have undergone prolonged practical tests upon the road, and the system—for which Mr. Alexander Craig, M.I.M.E., is responsible—has, we learn, proved itself to be eminently successful. It, at any rate, speaks well for it that the Singer Company should have selected it as their standard model, for, although hitherto they have not taken up the manufacture of touring vehicles, they have had a considerable amount of experience in petrol engine and motor cycle construction during the past few years. The Singer factory in Coventry, which we

visited recently, is particularly well suited for turning out these cars, and the reputation which the company have earned for high-class workmanship and finish is sure to assist materially in overcoming such prejudice as there is, amongst motorists, against any really original type of chassis, and to assist in popularising these new cars.

In these vehicles, the engine has its cylinders placed horizontally. In some respects, the design resembles that of a locomotive, for the connecting-rods are extremely long, and are—like the crank-shaft—extremely accessible, while the engine itself is swung quite low down in the frame. The engine cannot, of course, drive direct on to the axle, but, under ordinary circumstances—i.e., for the second and for the third speed—the power is transmitted direct from a sprocket on the crank-shaft to the differential-gear upon the axle. At first sight, it might appear as though the rear wheels were driven by the usual *pair* of outside chains, but this is not the case, because only one chain is employed at a

time, and thus a direct drive is obtained on both the higher speeds.

The Singer Company are making these cars in two sizes, and for both types a twin-cylinder engine is employed, but the change-speed-gear is somewhat differently arranged on the two models, and there are, too, other differences, to which reference will be made in due course. The 12-h.p. vehicle is a four-seater with a 7 ft. wheel base, and has cylinders with a bore of 4 in. and a stroke of 6 in.; it has a side entrance body with wide (18 ins.) doors to the back seats, and the body is so made that the front portion can be hinged up forwards, and the rear portion rearwards, to gain access to the whole of the machinery. The 8-h.p. car, which has a wheel base of 6 ft. 2 in., can be supplied either as a two or three seater, and its cylinders have a 4 in. bore by a $4\frac{1}{2}$ in. stroke. The former model weighs about 14 cwt., the latter about 10 cwt., and both have a track of 4 ft. 3 in.

Our illustrations give three characteristic views of the 12-h.p. chassis—from the right side, from above, and

pairs of skew-gearing—from the crank-shaft—by the longitudinal-shaft, C, that runs along outside the engine. The upper half of this casing has been removed in our illustrations, but that portion (C²) of it which contains the skew-gearing is visible in Figs. 1 and 2. This part rides freely upon the shaft, C, and so allows the entire casing to be hinged up about the shaft, C, when it is desired to remove a valve; normally, it is held down by a bolt at its further end. The ports leading from the valves to the carburettor, E—which is placed above the cylinder casting—and to the exhaust-pipe, F¹, are formed in the casting, so that there is no need to disturb the induction-pipe or the exhaust-pipe when taking out a valve.

The longitudinal shaft, C, has also several other duties to perform. Midway along its length, it is connected by enclosed

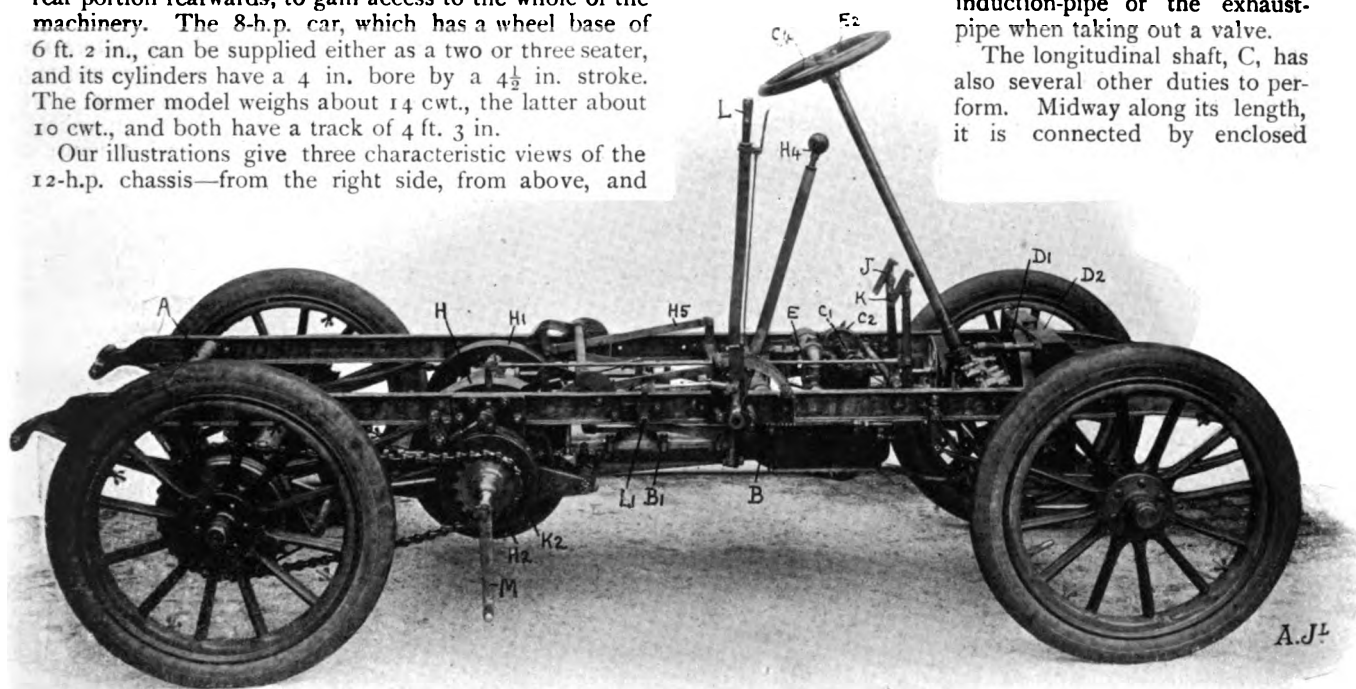


Fig. 1.—View of the 12-h.p. Singer Chassis, from the "off" side.

from beneath respectively—from which the general arrangement of the entire mechanism can easily be followed. The main-frame is constructed of rolled steel, with three tubular cross-members, A, and it is supported upon semi-elliptic springs, of which those at the rear are arranged outside it. Two of the cross-members, A, serve chiefly to hold the side-members together, but the intermediate member also has the cylinder-casting, B, bolted to it, and this fixing forms a third point of suspension for the engine and the gearing. The engine consists of the cylinder-casting, B, and of the aluminium crank-chamber, B¹, which has one large inspection door, B², over the long connecting-rods, and another door, B³, above the cranks. The crank-chamber, B¹, is rendered rigid—by a framework, of which the tubes, A¹, form a part—with the bearings that support the gear-mechanism on each end of the crank-shaft, and these bearings are in turn secured to the sides of the main-frame. The engine is thus given a three-point suspension, and the change-speed-gear forms, together with it, a complete and separately detachable unit.

All four valves are fitted vertically, from above, into the cylinder-heads, and can be removed complete with their seats, while the cam-shaft, C¹, is enclosed in a neat oil-tight casing above them, and is driven through two

gearing with the water-pump, D³, and with the oil-pump, G, and at its extreme forward end it carries a pulley-wheel, D, for driving the fan, D¹. The pump, D³, circulates the water from the radiator, D², through the cylinder-jacket, and is of the gear-wheel type, while it will be noticed that the radiator, D²—which is built up of finned tubes in a "tank-frame"—is mounted on a somewhat lower level than usual, and is placed just behind the forged front axle.

The carburettor, E, is of the float-feed type, and is rendered automatic by a specially-shaped atmospheric valve that is fitted in the air-supply pipe, E¹, in such a way that it not only admits more air at the higher speeds, but simultaneously reduces the injection action of the air upon the spray jet. Between it and the engine, is a throttle-valve that is controlled by the hand-lever, E², above the steering-wheel. Also mounted above the steering-wheel—on the other side—is a similar neat hand-lever for varying the time of ignition, this lever being connected with the commutator, C³—which is fitted on the extreme end of the cam-shaft. The ignition system is of the usual high-tension type, and the plugs project horizontally from the ends of the cylinders, but provision is also made for fitting a high-tension magneto on these cars. It will be noticed that the exhaust-box,

F¹, lies alongside the engine, on the left, and is connected with it by a comparatively short pipe, F¹. Attention, too, might be drawn to the arrangement of the steering-gear, since this is arranged considerably more forward than usual; it will be seen, too, that the tie-rod, that passes across from one steering arm to the other, lies behind the axle, and that the rod from the steering-gear itself is also transversely placed.

The connecting-rods on this engine are 28 in. long, and are of a very light **I** cross section; they are, however, extremely strong, and the two crank-pins on which they work are in line with one another. All the bearing surfaces of the engine are fed with oil by the pump, G, which draws its supply from the base of the crank-chamber, and delivers it to the two main bearings of the crank-shaft. From these points, it is led through holes in the crank-shaft into the "big-end" bearings, and, from there, it is conducted by pipes that lie along inside the connecting-rods, and is delivered on to the upper sides of

their shafts, yet one of them can be made to give a "first" speed forward, when brought into action, and the other to give the "reverse." The two clutches and the two epicyclic gears are controlled by the change-speed-lever, H⁴, which can be moved forwards or backwards in either of the two alternative slots in its quadrant, and be thus made to give either of the three forward speeds or the "reverse." Combined with this operating mechanism—of which the rods, H⁶, form a part—is the "clutch" pedal, J, which, on these cars, has the same effect as on an ordinary vehicle, since it can temporarily "throw out" whichever gear may happen to be in use at the time that it is depressed. It is normally prevented from doing so by the spring, J¹, but comes in play through the action of the rock-shaft, J², which forms a movable fulcrum for the gear mechanism. The starting handle, M, can be used from either side of the car, for it can be made to engage with either end of the crank-shaft.

The live-rear-axle is naturally of somewhat unusual

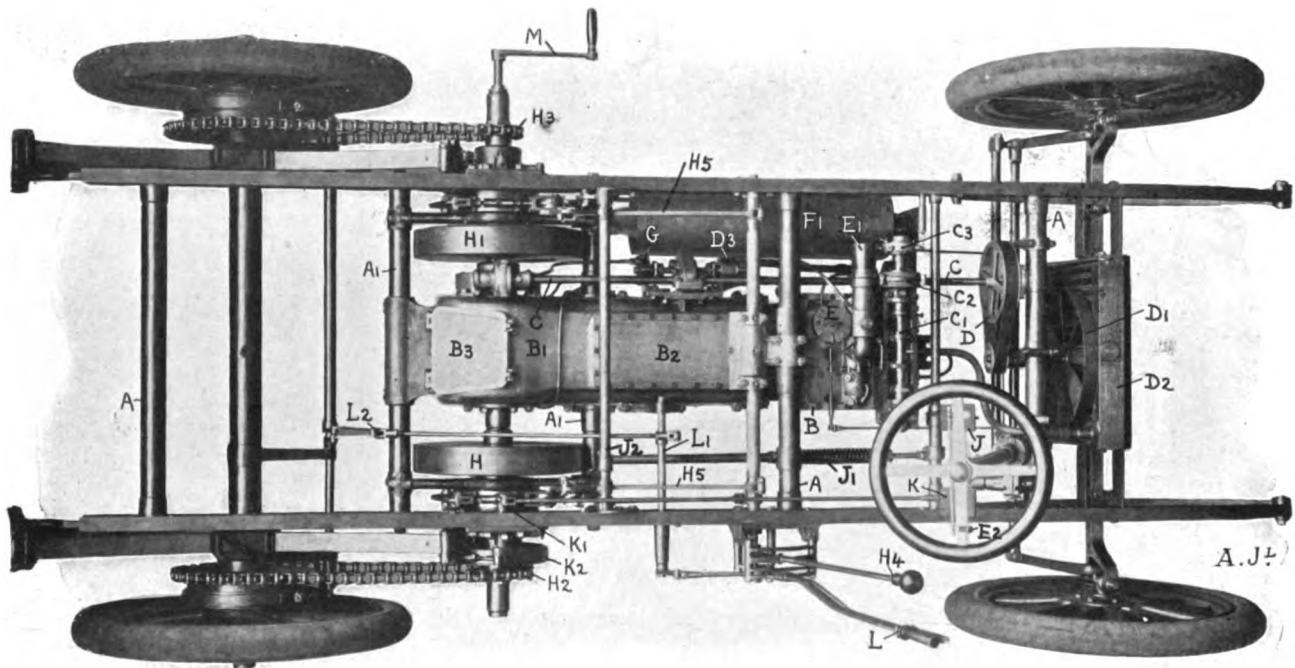


Fig. 2.—View of the 12-h.p. Singer Chassis, from above.

the cylinders. The use of these very long connecting-rods reduces the lateral thrust of the pistons against the walls of the cylinders, and it may here be noted, incidentally, that such side-thrust of this kind as there is is upward instead of downward, and that it more than counter-balances the weight of the pistons; this is a point which is worth mentioning in view of the objection, which—however imaginary—has more than once been raised by critics against horizontal engines.

Coming now to the transmission mechanism, attention should first be directed to the two flywheels, H and H¹, which are fixed, symmetrically, on each side of the engine. They both contain leather-faced cone-clutches, one or other of which normally renders the crank-shaft rigid with the outside sprocket, H², on the right, or with the other sprocket, H², on the left. Between each of the clutches and their respective sprockets, a special form of epicyclic-gear is, however, introduced, and, although both these gears normally revolve as one solid piece with

construction, since both the chain wheels are connected together by a sleeve that passes across inside the stationary outside tube, in order that either of the side chains shall be able to drive the shell of the differential gear. The differential itself lies close up inside the hub of the wheel on one side only, and there is a solid shaft that passes through centrally, from end to end of the axle, for connecting the differential mechanism with the other road wheel.

The usual hub-brakes are fitted to the driving wheels, and these are operated through the compensating device, L²—and the rock-shaft, L¹—from the hand-lever, L. The other brake is controlled by the pedal, K, and this brake (K²) is fitted just inside the high-speed sprocket, H², on the end of the crank-shaft. Its brake-drum is rigid with that sprocket-wheel, so that it can always act upon the shell of the differential through the chain on that side.

The 8-h.p. Singer car has considerably shorter connecting-rods, and, as we have already said, has also a

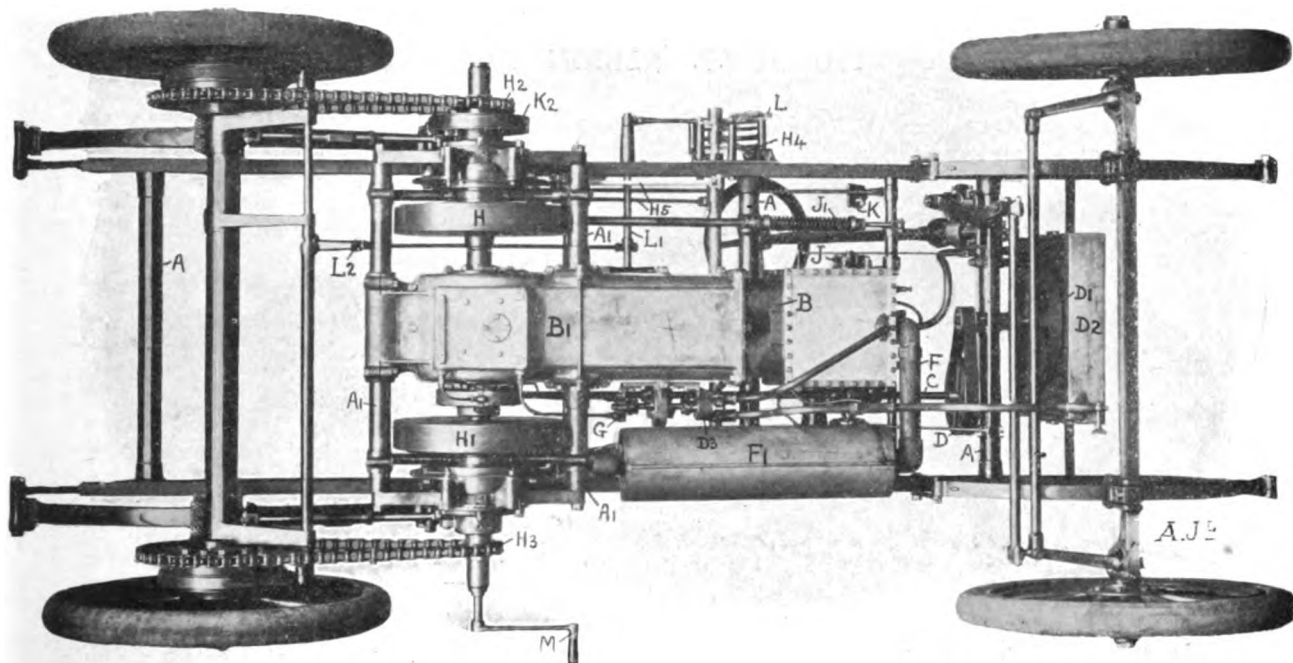


Fig. 3.—The 12-h.p. Singer Chassis, as seen from beneath.

shorter stroke, so that the engine does not occupy so much space longitudinally in the chassis. The chief differences, however, are that the low-speed and the "reverse" gears are obtained by a mechanism of the sliding spur-wheel type, instead of by epicyclic gearing, and that both these "speeds" are fitted on the one side only—between the high-speed clutch, H, and the sprocket H². The gear is not at all dissimilar from an ordinary two-speed and reverse mechanism, in which a direct-drive is obtained on the top-speed, but it is operated in the same way as is the gear on the 12-h.p. car—from the hand-lever,—and is subject to the "clutch-pedal."

The transmission mechanism and the road wheels on these cars are fitted with ball-bearings throughout, and both types of car are geared to run at speeds of from 4 to 40 miles per hour. The normal engine speed is 800 revs. per min., but we understand that even the larger engine is quite capable of speeding up to over 1,500 revs. per min. if so allowed to do. The 12-h.p. model has 32 in. by 3½ in. tyres, and the smaller 30 in. by 3 in.

Table of Reference Letters for the Singer Petrol Car Illustrations.

A	Tubular cross-members of main frame.	F ¹	Exhaust-box.
A ¹	Tubular members of engine and gear framework.	G	Lubricating pump.
B	Cylinder casting.	H	Flywheel, containing third-speed clutch.
B ¹	Crank-chamber casting.	H ¹	Flywheel, containing second-speed clutch.
B ²	Inspection cover for connecting-rods.	H ²	Sprocket for third speed.
B ³	Inspection cover for crank-shaft.	H ³	Sprocket for second speed.
C	Longitudinal shaft, driving cam-shaft.	H ⁴	Change-speed-lever.
C ¹	Cam-shaft.	H ⁵	Rods operating the gear mechanism.
C ²	Casing containing cam-shaft gear-wheels.	J	Clutch-pedal.
C ³	Commutator.	J ¹	Clutch-spring.
C ⁴	Timing lever.	J ²	Rock-shaft for disengaging gears.
D	Pulley, driving fan.	K	Brake-pedal.
D ¹	Fan.	K ¹	Rock-shaft for foot-brake.
D ²	Radiator.	K ²	Foot-operated brake.
D ³	Circulating pump.	L	Hand brake-lever.
E	Carburettor.	L ¹	Rock-shaft for same.
E ¹	Main air supply-pipe.	L ²	Compensating device for hub brakes.
F	Throttle-lever.	M	Starting handle.
F ¹	Exhaust-pipe.		

THE 16-h.p. LEA AND FRANCIS PETROL CAR.

IN view of the very full description that we have given of the Singer cars, it is unnecessary to more than point out the differences which exist between them and the larger vehicles that are built by Messrs. Lea and Francis, of Coventry, for they are all made—as we have said—under the same patents, and are, therefore, similar in the main.

The Lea and Francis chassis, which is altogether larger and more powerful, has a 3-cylinder engine of 4-in. bore by 6-in. stroke. There are separate bearings between each of the cranks, and the connecting-rods are even longer than they are on the 12-h.p. Singer—they are no less than 32 ins. long.

The main frame is constructed of pressed steel, and its cross-members are formed of square section tubing, while a further important feature of these extremely well-built vehicles is that roller bearings are substituted for ball-bearings in the road-wheels, the live-axle, and the gear-mechanism. The car has a wider track than usual

—4 ft. 10½ ins.—in order to allow the epicyclic gears, that give the low-speed and the "reverse," to be fitted on the same side, while still keeping the engine central between the side members; the wider track also enables an extremely roomy type of body to be employed. Although the radiator occupies the same position as on the Singer cars, it is much longer; behind it, there are placed two fans instead of one, that on the left being driven by gear-wheels from the longitudinal shaft of the engine, and that on the right being driven by a belt. Nominally of 16-h.p., the engine is capable of developing 18 or 20-h.p. at normal speed, and it frequently runs in practice—so we are told—at 1,200 revs. per min., while being able to attain a speed of 1,500 revs. per min. if desired. It is controlled entirely by hand, and appears to be so flexible, silent, and vibrationless, that the makers fully expect this type of car to soon establish an enviable reputation for itself.

THE 16-H.P. ALBION CAR.

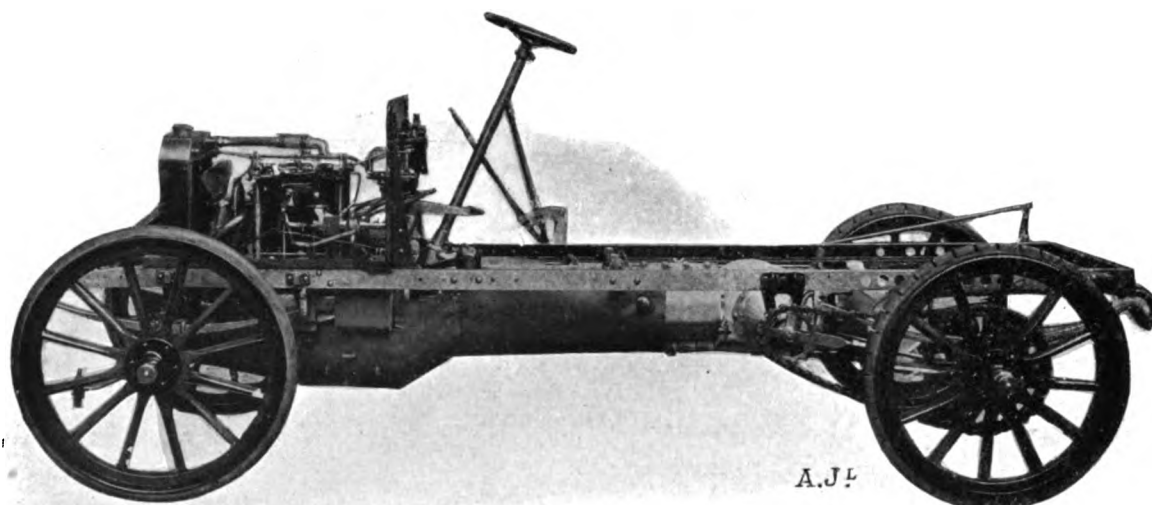


Fig. 1.—Side view of the 16-h.p. Albion Chassis.

As one of the few firms who have devoted their attention to the manufacture of vehicles more particularly intended for use with solid rubber tyres, the Albion Motor Car Company of Glasgow have achieved very satisfactory results. There is undoubtedly a large public to whom speed is a secondary consideration in a road vehicle, and to whom the ensured absence of punctures, among possible roadside troubles, is, at least, a more weighty consideration. It is to motorists of this class that the Albion car has been designed to especially appeal, for it is a vehicle in which every effort has been made to secure reliability before everything. On the other hand, however, it is anything but slow, it has no inherent drawbacks to render it unsuitable for higher speeds than is generally considered advisable with solid tyres, and the Company also fit pneumatics together with a higher gear ratio, when required.

In a very interesting paper* on the Albion cars, Mr. T.* Blackwood Murray, B.Sc., M.I.E.E., described its

* Read before the Glasgow University Engineering Society on February 2nd, 1905.

leading features and the objects aimed at by his firm, who designed and manufacture it. Instead of abstracting Mr. Murray's paper in the ordinary way, however, we have remodelled it to conform more closely with the other articles which have appeared amongst our "Cars and Systems" series, and, as we have also received photographs of the lantern slides and diagrams with which it was illustrated, we are able to give our readers the full benefit of Mr. Murray's interesting description.

In Figs. 1 and 2, are shown a side view and view from above, respectively, of the 16-h.p. Albion chassis, which is fitted with a 2-cylinder engine, a three-speed and reverse gear-box—which is rigid with the casing enclosing the differential countershaft—and a side-chain drive to the rear wheels. The chassis embodies several unusual features, some of which are peculiar to the Albion cars, notably the staggered arrangement of the transverse countershaft, which is distinctly visible in Fig. 2. Among the other features are:—the special design of low-tension magneto, which is keyed to the front end of the engine crank-shaft; the governor which regulates the "timing,"

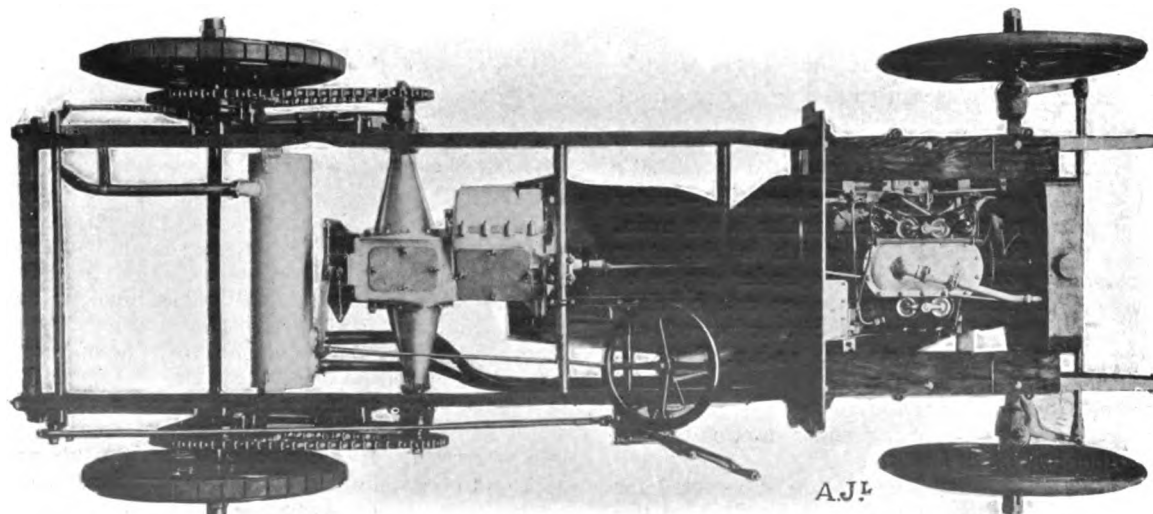


Fig. 2.—View, from above, of the 16-h.p. Albion Chassis, showing the staggered transverse countershaft.

the throttle, and also the auxiliary air-valve in the carburettor; and the spring-drive which is interposed between the clutch-shaft and the change-speed-gear.

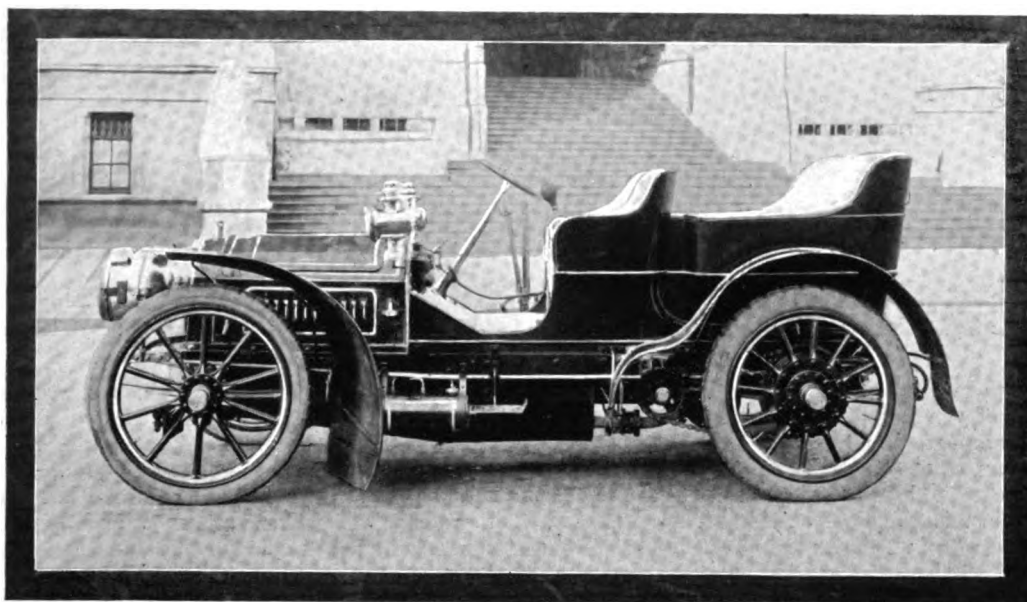
The frame of the chassis is constructed of channel steel and is carried by semi-elliptic side springs at both front and rear ends, those behind being slightly outside the main frame, which, in front of the dash, is somewhat narrower to give the steering wheel a full lock. Two tubular cross members stay the centre of the frame, and on one of these the front end of the gear box is supported by a single clip. The rear end of the gear-box is supported by the castings that enclose the counter-shaft, and are fixed direct to the main frame. The

engine is also carried by cross members, these being of channel section—bolted direct to the ends of the crank-chamber. A combined tank and radiator form the front of the bonnet, and a gear-driven centrifugal pump is employed for circulating the cooling water. The clutch, which is of the external cone type, is self centring on the engine crank-shaft, and, between the clutch and the gear-box, is a longitudinal shaft which is of different lengths to suit the different chassis. For all types, however, the track remains 4 ft. 6 ins., although the wheel base varies from 7 ft. to 8 ft. 5 ins. according to the type of body.

(To be continued.)



THE 1905 CROSSLEY CAR.

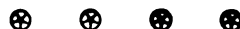


⌈ One of the latest 22-28-h.p. Crossley Cars.

PROMINENT among the features of last year's Show at the Crystal Palace was, it will be remembered, the 22-28-h.p. Crossley car, which was exhibited by Messrs. Jarrott and Letts. No startling change has been made in these vehicles since then, but, profiting by the road experiences of the past year, several minor alterations have been introduced, although the actual capabilities of the car have, from the first, been remarkably satisfactory.

The most important alteration relates to the omission of the rotary cut-off valve, which was peculiar to this

car. Its object was, it will be remembered by those who read our description of this apparatus in our issue of January 20th, 1904, to give an equivalent effect to that obtained by a "variable lift" device. In practice, this has been found a superfluous refinement, and has, in consequence, been abandoned. An improved design of tappet for the low-tension ignition has also been devised, and a most ingenious fitting for facilitating the removal of the valves is a useful addition, as is the foot accelerator which acts independently of the hand control on the throttle.



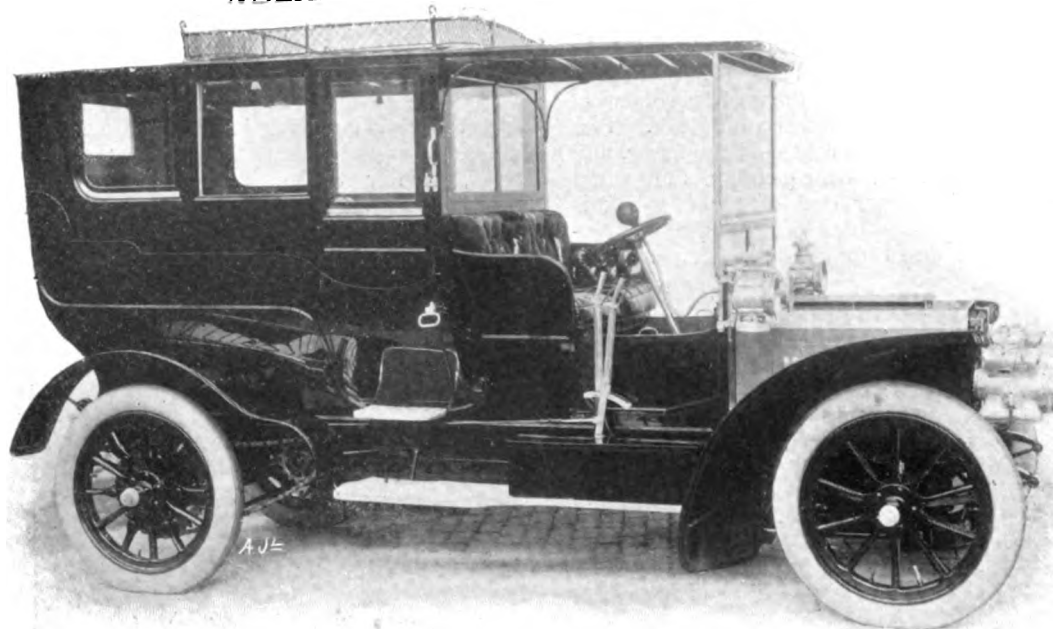
THE ARIEL CARS FOR 1905.

AMONG the "all British" cars, the Ariel have gained a well-deserved reputation as successful touring vehicles. This year, the Ariel Company are making four distinct models, namely, 15-18-h.p., 18-22-h.p., 20-25-h.p., and 30-35-h.p. Of these, the first three are fitted with 4-cylinder engines, while the last has the 6-cylinder chassis, which was the feature of the Ariel Company's stand at the Crystal Palace Show last year.

This year, the new model is the 20-h.p. chassis, the engine on which has its four cylinders cast in one, but with separate heads. The bore is $4\frac{1}{2}$ ins., and the stroke $4\frac{3}{4}$ ins.; the inlet valves are mechanically operated, are

situated above the exhaust valves, and are worked from rocking levers. High-tension magneto ignition is employed, but a supplementary form is available from the batteries also provided. The frame is of pressed steel and has tubular cross members. The gear box gives four speeds and a reverse, with a direct drive to the live axle on top speed. The gear shafts run on ball bearings, and the change-speed lever operates the sliding pinions through a rotating cam plate. The wheels also run on ball bearings, which are carried by tubular extensions of the axle casing, and the wheel base and track are 8 ft. 6 ins. and 4 ft. $4\frac{1}{2}$ ins., respectively.

THE MAUDSLAY PETROL VEHICLES AND ENGINES.



One of the handsome 27-h.p., 3-Cylinder, Maudslay Cars, of which a number have been built by these makers.

QUITE a large variety of petrol engines for various purposes, and of vehicles—both for private use and for commercial work—are now being made by the Maudslay Motor Company, whose Coventry works have had to be considerably extended in consequence of the recent developments in this direction. Their engines now vary in size from a new twin-cylinder 14-h.p. model up to one of 200-h.p., which has six cylinders, and is now going

through the shops. Although, for automobile work, they have several models, yet the cylinder bore is the same in all cases, and hence certain of the parts are to some extent common to all these engines. To standardise the work still further, the same stroke has been adopted for the new 2-cylinder, 14-h.p. and 4-cylinder 30-h.p. types—which the company are introducing this year for the first time—as is used on their present 3-cylinder

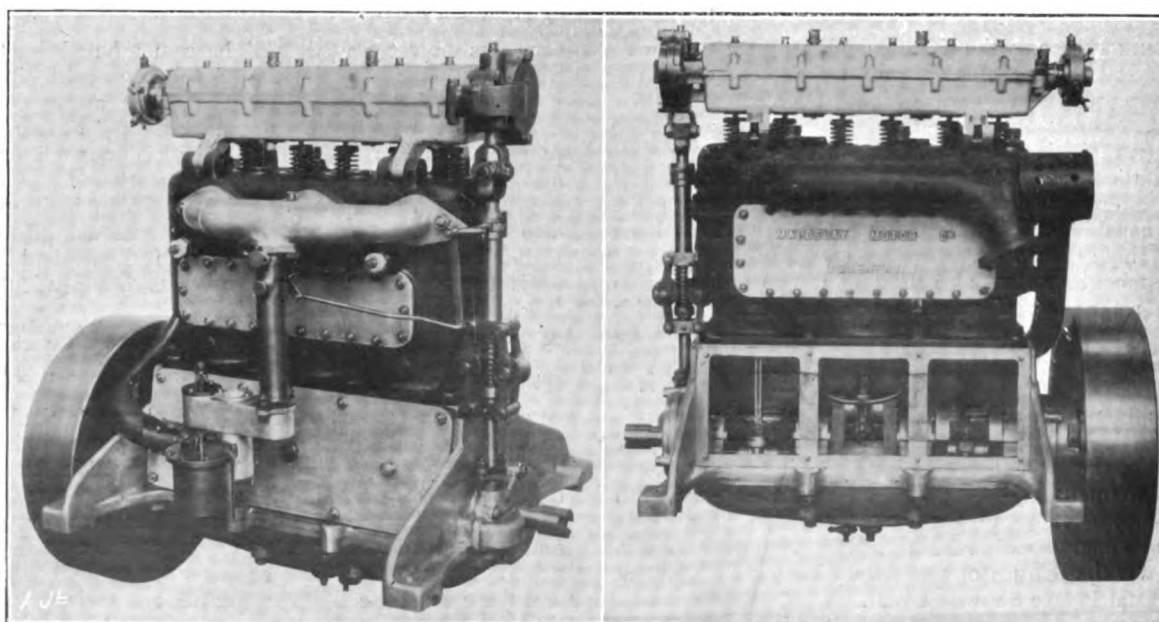


Fig. 1.—Two views of a 3-Cylinder, Maudslay, Petrol Engine, showing the arrangement of the Valves and the Cam-Shaft above the Cylinder-Casting, and also demonstrating the accessibility to the Crank-Chamber.

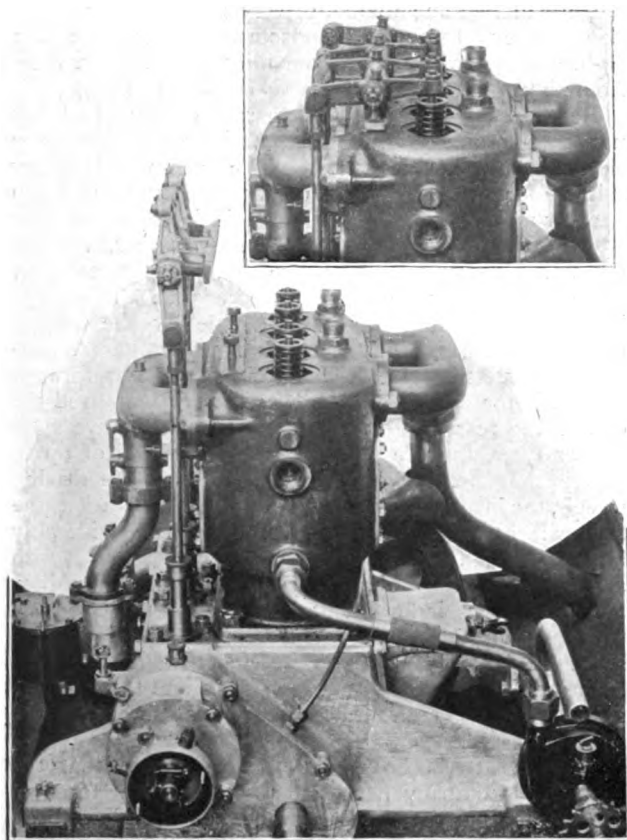


Fig. 2.—Front view of the new 14-h.p., Twin-Cylinder, Maudslay Engine, showing the manner in which the Valve-Operating Levers can be removed to give access to the Valves. In the upper portion of the illustration, the Valve-Gear is seen in its normal position.

20-h.p., and 6-cylinder 40-h.p., models, while they invariably employ the same cylinder-casings to produce a 4-cylinder, as a 2-cylinder, and to build a 6-cylinder, as a 3-cylinder, engine. The 14, 20, 30, and 40-h.p. engines all have a short stroke in relationship to the bore— $3\frac{1}{2}$ ins. as against 5 ins.—and the normal speeds are either 900 or 950 revs. per min. Apart from them, the other standard model is a 3-cylinder 27-h.p. engine, which closely resembles the lower-powered 3-cylinder model, except that the stroke is equal to the bore—both being 5 ins.—and this engine naturally lends itself to the production of 6-cylinder type giving about 60-h.p.

In all these engines, the well-known characteristic of the Maudslay design is retained, for the valves are fitted direct into the cylinder-heads, from above, and are arranged in line with one another along the centre of the engine. Either valve can be removed, complete with its seat, without disturbing the inlet or exhaust-pipes, since the necessary ports that communicate between those pipes and the valves, are formed in the cylinder-casting itself. In these respects, the new twin-cylinder and 4-cylinder models also follow previous Maudslay practice, but a totally different arrangement has been adopted in their design for the valve-operating mechanism. Instead of mounting the cam-shaft inside a separate casing, above the cylinders, so that the cams can act direct upon the valves, the cam-shaft is enclosed in the upper part of the crank-chamber, and the valves are operated by long, vertical push-rods, which act upon them through pivoted levers.

One of the 3-cylinder engines is shown from both sides in Fig. 1, and a view of the new 14-h.p. engine is given in Fig. 2, so that our illustrations may be said to represent the general features of all the Maudslay engines. In Fig. 1, the neatly-hinged casing above the cylinder-casting is well shown, as also are the universal joint and the centrifugal governor—on the vertical shaft that drives the cam-shaft—the former of which allows the casing to be hinged over, when it is necessary to remove one of the valves beneath it. In Fig. 2, a separate view is given of the upper portion of the 14-h.p. engine, the one photograph showing the valve-operating levers in their working positions, and the other demonstrating the manner in which they can be swung up out of the way when a valve has to be taken out.

The 3-cylinder models were very little changed since last year, but the induction-pipe-fitting is now formed in such a way that the explosive mixture travels precisely the same

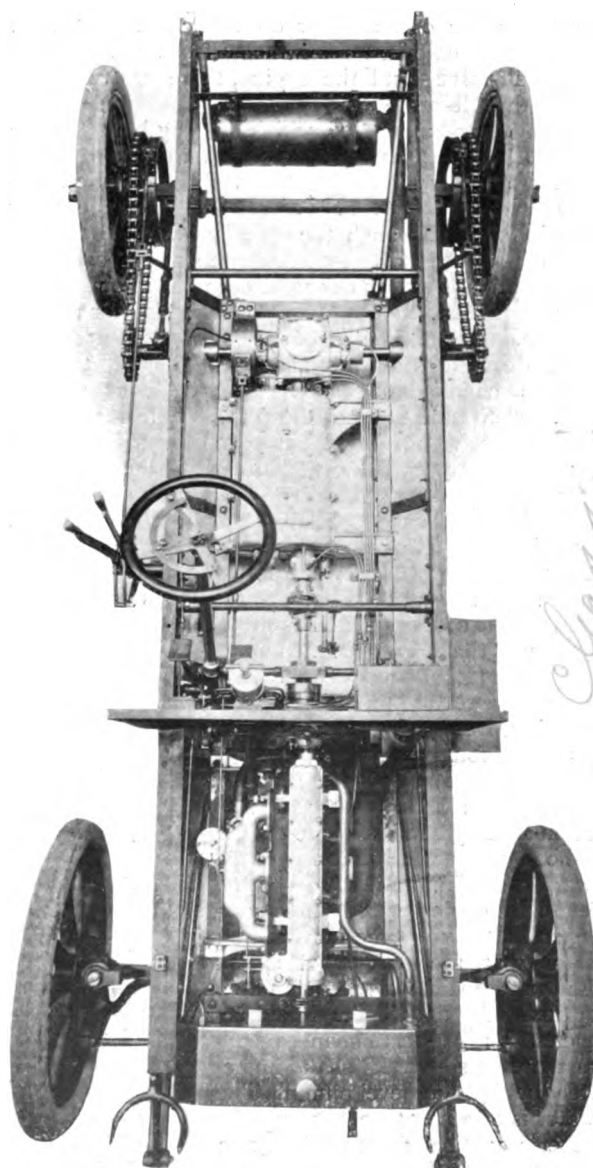


Fig. 3.—View of a standard, 3-Cylinder, Maudslay Chassis, from above, showing the arrangement of the Mechanism, and the construction of the Main-Frame and Under-Frame—which latter are built up of Square Tubing.

distance to each inlet-valve. The crank-shafts for the 6-cylinder engines have their cranks set so that the two outer, the two intermediate, and the two inner crank-pins are in line with one another, respectively, and the valves are set so that the cylinders fire in the order: 4, 1, 5, 3, 6, 2. There is, too, a very long central bearing for the crank-shaft, in addition to those between each crank.

The 14-h.p. engine has a normal speed of 900 revs. per min., and is capable of giving about 18-b.h.p. at 1,000 revs. per min. A single casting forms the two cylinders, and the two inlet-valves are placed between the two exhaust-valves. Although the cam-shaft prevents such large inspection doors from being fitted to both sides of the crank-chamber, yet the door on the opposite side is of sufficient size to enable the piston and the connecting-rod to be removed through it. As will be seen from our illustration, the commutator is fitted on the front end of the cam-shaft, and there is a chain-driven pump for circulating the cooling water. The two cranks are set opposite one another on the crank-shaft, and, between the carburettor—which has an automatic auxiliary air-valve—and the engine, there are two independent throttle-valves.

Even the 200-h.p. engine, which is being built for the General Electric Company of U.S.A., and is to be used on a railway coach, in conjunction with an electric transmission system, is of same general design as the other 6-cylinder models, though the cylinders have a bore and stroke of 9 inches. The crank-chamber is of cast iron, and the normal speed is 600 revs. per min. Some of the company's 27-h.p. motors are being supplied for railway work also. At the time of our recent visit, three were ready to leave for South Africa, where they are to drive coaches accommodating seven passengers, as well as goods, and to run at speeds of up to 18 miles per hour.

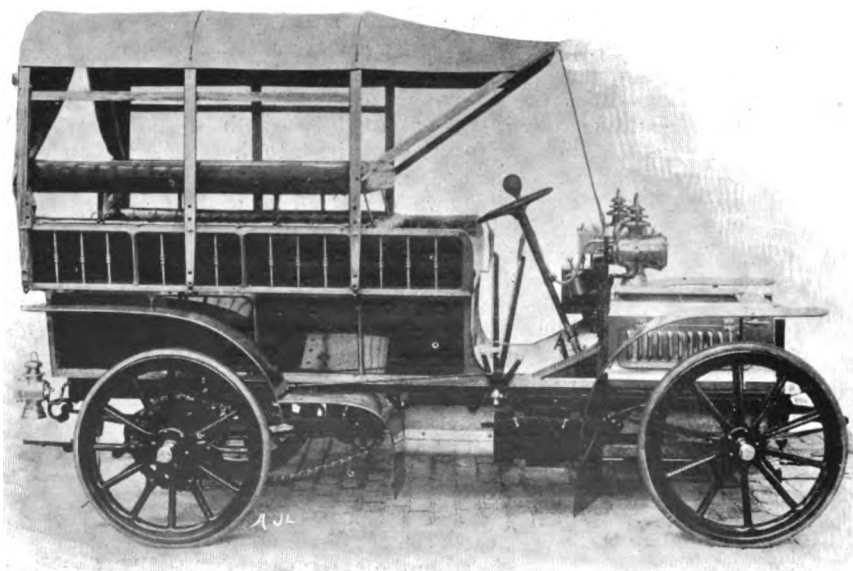
Prominent amongst new types of vehicle that are being introduced this year, is the very useful "All-round" car shown in one of the accompanying illustrations—a model that has been designed specially for country-house work. As will be seen, it has a roomy wagonette type of body, and is provided with a serviceable canopy, and with side curtains; there are seats for eight persons behind the driver. The chassis, which is fitted, with one of the new 14-h.p. engines, has its main frame constructed of ash-lined, square-section tubing, and is on the chain-driven type, with solid rubber tyres on all four wheels. The cone-clutch is connected with a separate throttle-valve from that which is manipulated by hand, and the engine has no automatic governor. Three forward speeds and a reverse—with a direct drive on top speed—are available, and a feature of the transmission gear is that the differential is enclosed in a separate casing behind the gear-box. As on all the Maudslay vehicles, a roller-bearing and a ball-thrust are fitted on its shaft, immediately behind the bevel-pinion. The radiator is of a new type, built up of a number of vertical finned tubes, in a framework that forms the necessary water tank.

The makers' standard pleasure vehicles have undergone very little in the way of modified design lately, and

are, it will be remembered, of very substantial construction. One of these very handsome carriages—one of a 27-h.p.—is shown in one of our illustrations, and a view, from above, of a standard chassis is given in Fig. 3.

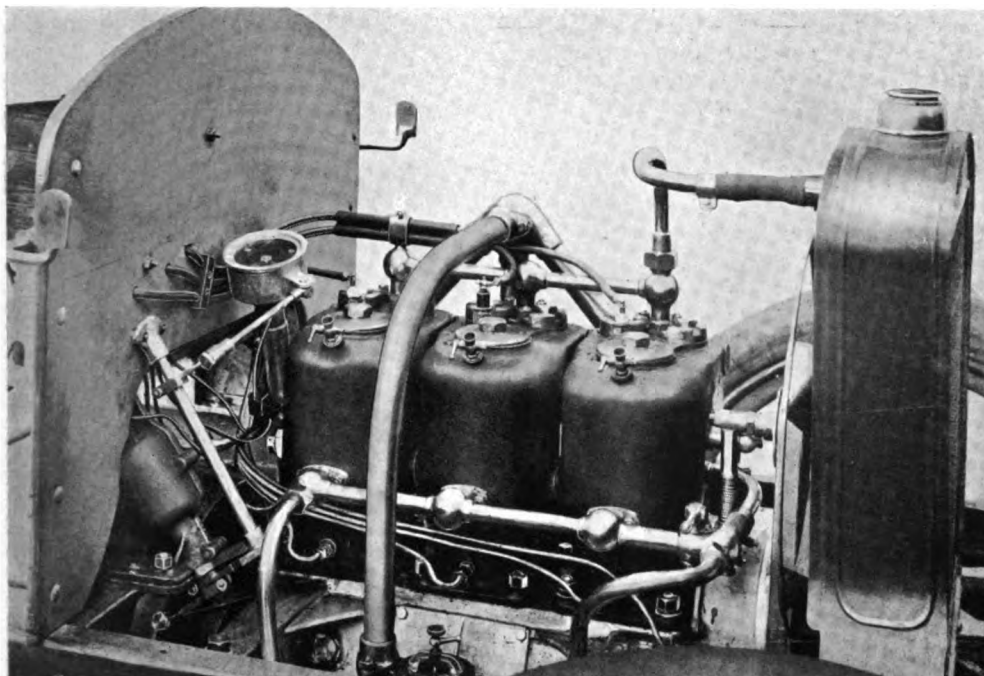
Recognising the rapidly increasing demand that has now sprung up for commercial vehicles, the Maudslay Company are building a type of chassis that is either suitable for single-deck 'buses or for 2-ton luries, and also another much heavier chassis that is intended to take 5-ton loads. Already, they have on order, for the G.W.R. Company, three 'buses of the former type, these being fitted with their 14-h.p. engine. The frame is designed to take either this engine or the 20-h.p. model, and it has a wheel base of about 10 ft. A gear-box, constructed on Mercedes lines, giving four forward speeds, is employed, and side chains are employed for driving the rear-wheels. The present 'buses have solid rubber tyres, and are geared to run at speeds of up to 12 miles per hour. Twin tyres are used on the driving wheels, the inner pair of tyres having the same track as the front wheel tyres—5 ft. The 5-ton chassis is considerably heavier throughout. It has a channel steel frame, with an underframe for the 27-h.p. engine and the gear-box, and there is an independent framework—which is rigid with the back axle—that carries the differential counter-shaft. This framework is only connected with the main frame by a ball-joint, centrally, in front, and the counter-shaft drives the road wheels by pinions meshing with internal gear-wheels.

From what has been said, it will be seen that the Maudslay Company have laid themselves out to cover the greater part of the very wide field that has been opened up of late years by the development of high-speed petrol engines. For marine work, their automobile engines have been modified to the required extent, and a special form of reversing gear, in which metal-to-metal expanding clutches introduce the direct "ahead," and the bevel-gear "astern" speeds, is made for use with them. The works are not at present as large as those of a few other makers in this country, but they are thoroughly well equipped with all the necessary up-to-date machinery, and are eminently well suited for their purpose.



The new 14-h.p. "All-Round" Car, which is being introduced by the Maudslay Company this year.

THE 3-CYLINDER "NATIONAL" CAR.



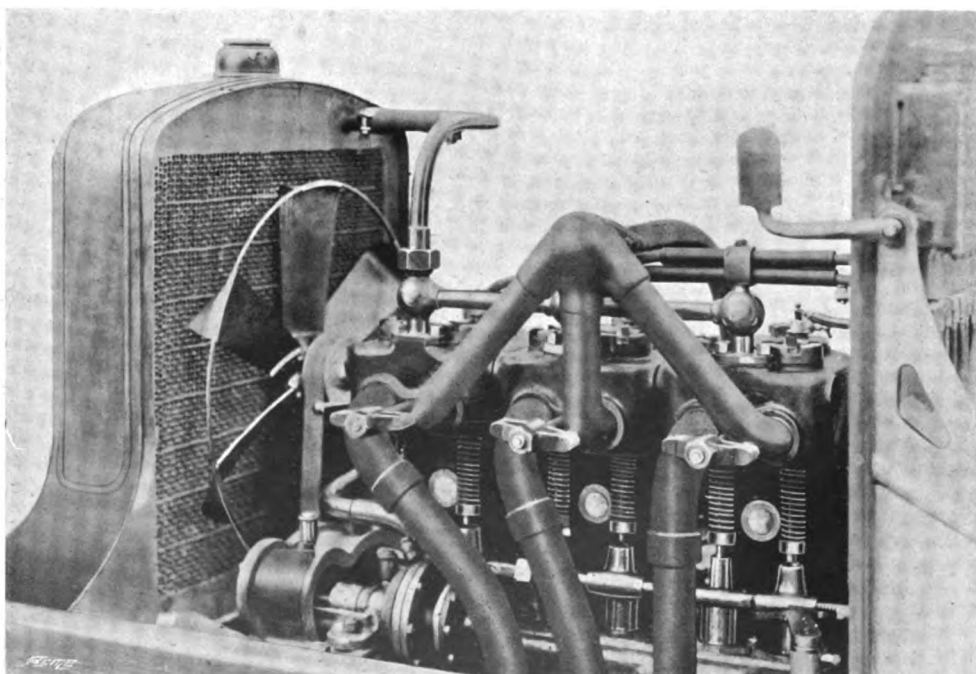
The 3-Cylinder 15-20-h.p. Engine, fixed in place in the National Chassis, from the Off Side.

In July last year we described the 3-cylinder "National" petrol car, which is manufactured at Gainsboro' by Messrs. Rose Brothers, and is sold by Messrs. Lamb Brothers and Garnett, in London. The illustrations that we are now able to give, show the engine in place on one of the latest cars, from both sides, and although the manufacturers have been unable to secure a stall of their own at Olympia, yet this 15-20 h.p. vehicle is to be exhibited by Messrs. Martin and Flewitt, who have built the body.

The cylinders are cast separately and have a bore of 4 ins. with a stroke of 5 ins., while it will be seen the interchangeable inlet and exhaust valves are placed on the same side of the engine, and are operated from one cam-shaft. A variable lift device is employed for the inlet-valves regulating the power of the engine, and this is controlled by hand—there being no automatic governor provided.

The inspection-covers above the valves are now screwed into the cylinder-casting, and the high-tension ignition-plugs are placed in those above the inlets, while the commutator is mounted upon an almost vertical shaft, so that it lies in a particularly accessible position. The circulating pump is visible on the valve side of the engine, and is driven by gearing, while behind the radiator, is seen the belt-driven fan. The carburettor is placed on the opposite side, and the induction-pipe passes right across above the engine.

It will be remembered that this car is of the live-axle type, and that the pressed steel frame has a separate under-frame to carry the engine and the gear-box, while the semi-elliptic side springs that support it above the back-axle are outside, instead of beneath, the side members.



Another View—from the Near Side—of the 3-Cylinder National Engine, in place on the Car, showing the Valves, Ignition Plugs, Pump, and Fan.

THE 1905 GLADIATOR CARS.

ILLUSTRATIONS

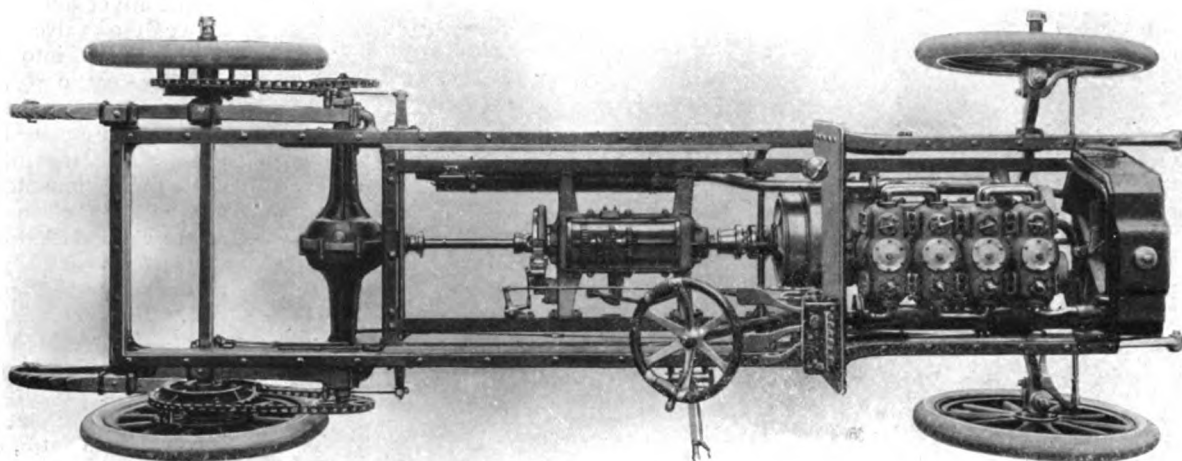


Fig. 1.—View from above of a 4-cylinder Gladiator Chassis.

SEVERAL interesting features have been introduced into this year's 4-cylinder Gladiator cars. The general appearance of the chassis is very clearly shown in Fig. 1, which gives a view from above. In Fig. 2 is seen the 4-cylinder engine which is of particularly neat construction. The cylinders are all cast separately and have their valves on opposite sides. The high-tension ignition plugs are fitted into the inspection covers over the inlet-valves, and are

worked from a magneto which is gear-driven from the inlet-valve cam-shaft.

An unusual method has been adopted for coupling up the circulating water-pipes, for the cylinders are now connected up in series, so that the water passes through one after the other, instead of passing through the jacket of each independently. The armoured wood main-frame is supported on semi-elliptic springs in front, but at

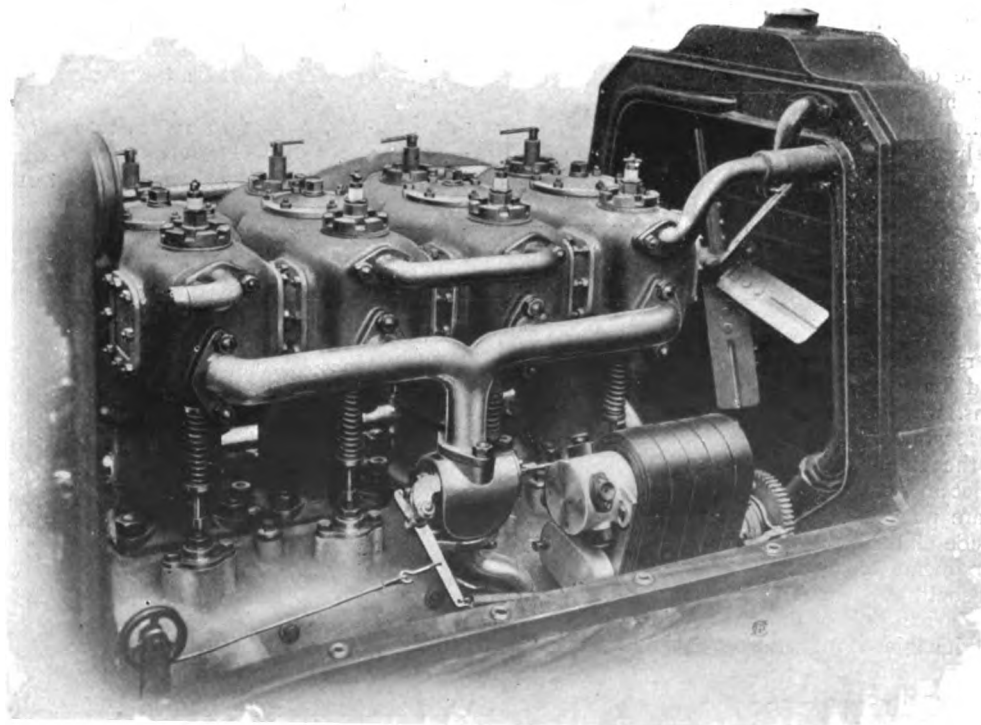


Fig. 2.—Side view of a 4-cylinder Gladiator Engine.

the rear a new form of leaf-spring-hanger is employed. Both engine and gear-box are carried on an underframe running from the front of the car to the cross-member in front of the differential countershaft casing. The clutch has a spring drive embodied in it to cushion any shocks. In future, moreover, we hear, that the "Bradley" clutch is to be used. The gear-box does not contain the

differential, but is placed midway between the clutch and the differential countershaft, from which the side-chains drive the rear wheels. A novel form of control is introduced into the steering wheel, in which portions of the rim can be twisted round to operate Bowden wires acting on the throttle and the timing.



THE ARGYLL CARS FOR 1905.

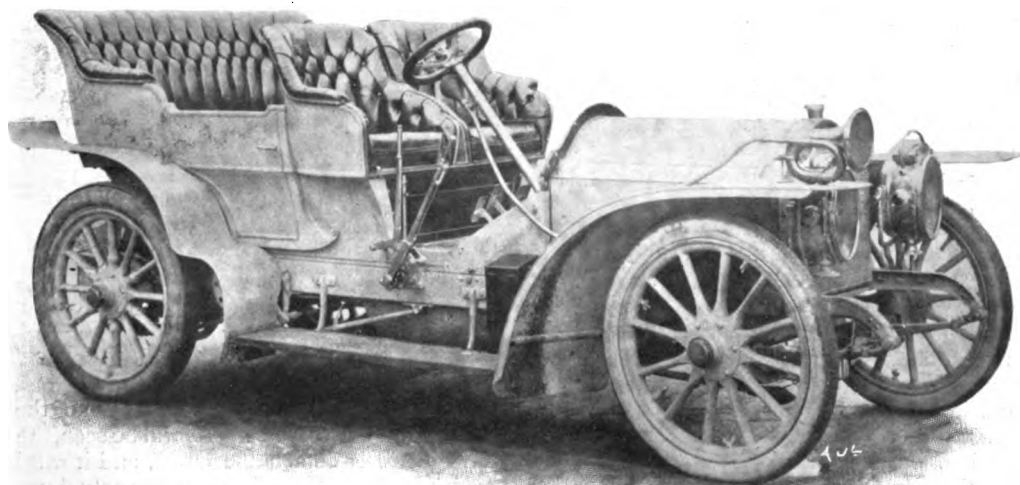
THE Hozier Engineering Company were among the few English firms represented at the recent Paris Salon, where they had on view for the first time the 16-20-h.p. chassis, which is their special feature this year at Olympia also. Some of the leading features of this chassis, we gave at the time. The engine has, it will be remembered, separate cylinders of 88-mm. bore by 130-mm. stroke. A multiple disc clutch is employed in conjunction with the usual Argyll gear-box, which gives three speeds and a reverse. The change-speed lever arrangement is peculiar to the Argyll cars—all the forward speeds being obtained by a lever working in a three-way slot, while the reverse is engaged by a separate lever. A special feature of these cars is the inverted U section of the pressed steel frame, and minor refinements have been introduced in the shape of ball-and-socket joints between

the links of the various control levers. Artillery wheels of the staggered spoke pattern have also been adopted on them.

Besides the 4-cylinder 16-20-h.p. car just mentioned, the Hozier Engineering Company are also manufacturing a 2-cylinder 10-12-h.p. car fitted with an Aster engine, a 3-cylinder 12-14-h.p. car fitted with an Argyll engine, and a 4-cylinder 20-24-h.p. car, similar in design to the 16-20-h.p. vehicle but with the additional feature of an epicycloidal type of universal joint for the propeller-shaft, which has just been introduced by this firm. In addition to these four types of touring cars, a 12-h.p. light delivery van is also being manufactured, this vehicle, of which we give an illustration on another page, being fitted with the 2-cylinder Aster engine.



THE NEW 40-h.p. DE DIETRICH MODEL.



One of the new 40-h.p. De Dietrich Cars, showing the honeycomb radiator that has now been adopted.

CONSIDERABLE modifications have taken place in the design of the standard 40-h.p. De Dietrich Car, which, it will be remembered, was first shown in its new form at the recent Paris Salon. The chassis is fitted with a 4-cylinder engine, the cylinders of which are cast in pairs. The inlet-valves are centrally situated in the cylinder heads, and are all operated from the exhaust cam-shaft by vertical push-rods and rocking levers. The low-tension igniters are on the opposite side, and are operated from their own cam-shaft. The engine is fixed to the main frame, and has very large inspection covers on each side of the crank-chamber.

The adoption of the honeycomb radiator, in place of the "Loyal" finned tube type hitherto used on these cars, is, perhaps, the most apparent change which has

been made. A new carburettor has also been adopted. The throttle and timing levers are above the steering wheel. The throttle is inter-connected with the clutch and also with another foot-pedal, which is rendered superior to the action of the clutch-pedal, so that the engine may be accelerated while the clutch is disengaged. The low-tension magneto is gear-driven from the centre of the ignition cam-shaft, and the timing lever simultaneously acts on the armature of the Simms Bosch magneto, and on the tappets. The clutch is of the external cone type, having a stationary spring. The inner member is self-centering, and is carried on two pins which project from radial driving arms. By an ingenious design of clutch-operating mechanism this internal member may be easily removed.

There are two universal joints between the clutch and the first-motion-shaft. The gear-box is carried by four clips from the tubular cross-members, which stiffen the pressed steel frame. This method of support for the gear-box, and the general design of the other members, enable it to be let down at one end or entirely removed, so that an examination can be made without lifting the floorboards of the body. Flexible jaw-couplings are fitted in the ends of the differential-countershaft, between the gear and the chain-sprockets, which are supported by bearings from the main-frame. An improvement has also been introduced into the steering-gear, for the lever-arm, which projects from it, is now supported by bearings

on both sides, so that it is no longer overhung. Ball-bearings have been adopted throughout, except on the engine.

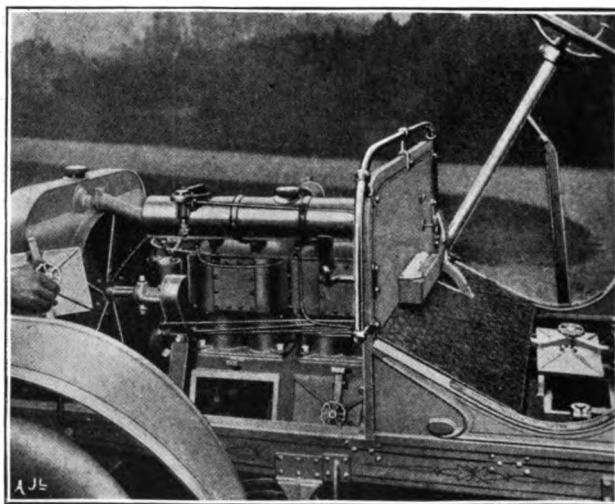
As an example of luxury in road vehicles, the 40-h.p. Voiture-de-Route, having this type of chassis, now on view at Olympia, would be hard to beat. This car is very long, the body itself being no less than 12 ft. long. The central portion is arranged as a parlour car in the day-time, and as a bedroom at night, while, behind, is a second compartment, divided off into a kitchen and lavatory, so that the owner might make this veritable travelling palace his temporary home, and experience no inconvenience of any kind.



THE 1905 "WINTON" CARS.

As already announced, the Winton Company are this year introducing an entirely new type of vehicle, which is being made in three sizes, and has 4-cylinder vertical engines instead of horizontal engines. The first of these new cars has now reached this country, and is on view at Olympia, in company with several of the earlier 20-h.p. vehicles, of which we gave a fully illustrated description in October and November last. The new car is of the 16-20-h.p. type, and is practically identical in design with the 24-30-h.p. and the 40-50-h.p. models that are also being made. Although this vertical type is, in general arrangement, very similar to the usual type of European car that has a live-axle and propeller-shaft form of drive, yet many of the distinctive Winton features have been retained, and other more or less novel characteristics have been introduced. The engine and the gear-box are fixed direct to the pressed steel frame, and the frame is, as usual, carried on semi-elliptic side springs, but, in order to ensure easy riding, whether one or two passengers alone, or the full complement are carried, the back springs are fitted in such a way that either three leaves only or all six can be brought into play at will. The frame is designed to take a side-entrance body. The engine has its cylinders cast in pairs, and the atmospheric inlet-valves—above the exhaust-valves—have the same ingenious pneumatic control of which we have already given very full details. Special care has been taken to render the crank-chamber accessible, for it not only has large detachable doors on one side, as seen in the accompanying illustration, but the crank-chamber is divided vertically down the centre, and this entire side can be removed separately. High-tension ignition-plugs, fitted centrally into the cylinder-heads, are employed in connection with a gear-driven magneto, and a mechanical system of lubrication has been adopted.

Instead of fitting the main-clutch between the engine and the gear, the gear-box itself contains individual



The Front Portion of the New 16-20-h.p. Winton Car, which has a 4-Cylinder Vertical Engine. In this Illustration, one of the large Crank-chamber Doors, as also the lid of the Gear-box, have been lifted off to demonstrate the accessibility obtained. Placed above the Engine, are seen the small auxiliary Petrol-tank and the Oil-tank.

clutches, one of which introduces each of the two forward speeds and the "reverse." As will be seen, the gear-box has a large easily-detachable cover, and it will be realised—from what has been said—that the actual gear mechanism itself is much the same as that which we have previously described in connection with the earlier cars, the chief difference being that the shafts now lie longitudinally, instead of transversely, in the frame. The live-rear-axle is provided with roller-bearings, and its differential-gear is of the spur-wheel type.

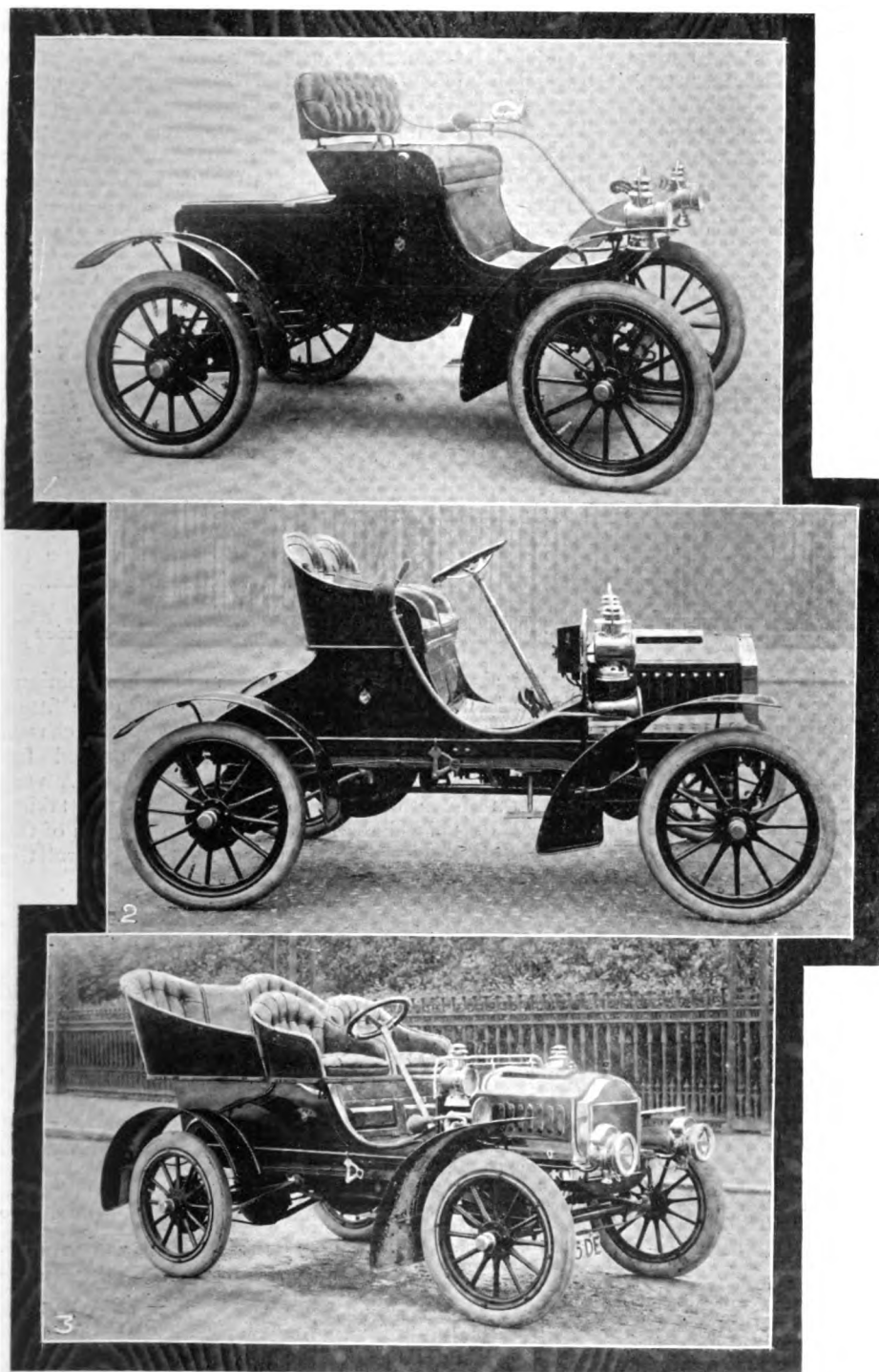


THE NEW LANCHESTER MODEL.

A Vertical Engine.—Amongst the new 1905 British cars, one of the most sensational will probably be the new 4-cylinder Lanchester, for, although, several of their distinctive features have been retained, a vertical engine has been adopted. Even now, however, there is little about the design that is characteristic of general practice, for the engine is placed centrally

under the driver's seat, and lies with its crank-shaft longitudinally in the frame. The engine is water-cooled. We understand that the suspension remains practically unaltered, and that the transmission is the same as before, the power being transmitted by an epicyclic-gear, a propeller shaft, and a worm-drive to the live-rear-axle.

THIS YEAR'S OLDSMOBILES.



Views showing each of the three 1905 Oldsmobile Models.

AMONG those cars which appeal to the "man of moderate means," the Oldsmobile has achieved a well-deserved reputation which shows no signs of abating. A short time ago—in our issue of January 21st, 1905—we gave an illustrated description of the very extensive

works at Lansing, U.S.A., where these famous little American cars are manufactured by the thousand. Readers of that article will, perhaps, have gathered some idea of the system of standardization that is necessary to produce a satisfactory car at so low a price.

The 1905 cars are similar to those which took part in the Small Car trials at Hereford, and consist of a 7-h.p. Runabout and a 9-h.p. Tonneau. Besides these, however, is a modification of the 7-h.p. car, having a European type of body, with adjustable wheel gearing and tanks under the bonnet, as on the 9-h.p. vehicle. The largest of these cars was fully illustrated and described in our issue of August 13th and 20th, 1904, and the machinery of the smaller models is very similar in design.

The new engine is, of course, considerably more powerful than the old 5-h.p. model—for the bore has been increased from $4\frac{1}{2}$ ins. to 5 ins.—and another important alteration in the design is that the cylinder casting is now quite distinct from the casting forming the crank-chamber. The joint between the cylinder and the head is consequently done away with, and the head is cast in one piece with the valve-chamber and the jacket. In the runabout type the radiator is beneath the body in front, but in the other models it forms the front of the bonnet.

Although the Runabout type of body has won considerable favour, yet there are several to whom wheel steering and a European body are almost a *sine qua non*. To these the modified two-seater will particularly appeal. A further feature of the Oldsmobile cars this year is the adoption of Continental tyres.

Messrs. Jarrott and Letts are also showing at Olympia the very handy little delivery vans brought out by the Oldsmobile Company, and—in addition—a railway inspection trolley which has met with considerable success in America.

THE 1905 CLEMENT CARS.

SEVERAL interesting features this year characterise the Clement models, controlled in this country by Mr. E. H. Lancaster. Four types of chassis are comprised in the complete range of vehicles, and, of these, two—namely, the 2-cylinder 10-12-h.p. and the 12-14-h.p. 4-cylinder cars—are similar to last year's models. Besides these, there is the new 16-20-h.p. vehicle, which is the feature of Mr. E. H. Lancaster's stand at Olympia, and the 24-30-h.p. car which, although in other respects similar to the 16-20-h.p. car, is peculiar for being chain-driven, while all the other types have live-axes.

The engine of the 16-20-h.p. chassis is of the

through each jacket in turn, the pipe connections being clearly visible in Fig. 2. High-tension magneto-ignition is employed, the magneto being gear-driven from the exhaust-valve cam-shaft.

Both the engine and the gear-box are bolted to an angle-iron under-frame, which is supported by the cross-members, used to stiffen the armoured-wood main-frame. The latest clutch is of the metal-to-metal disc pattern, but the gear-box is similar to last year's model, except that D.W.F. ball-bearings are employed. The bevel-drive on the rear-axle can be supplied to give either of three gear-ratios that may be required. A spur type of differen-

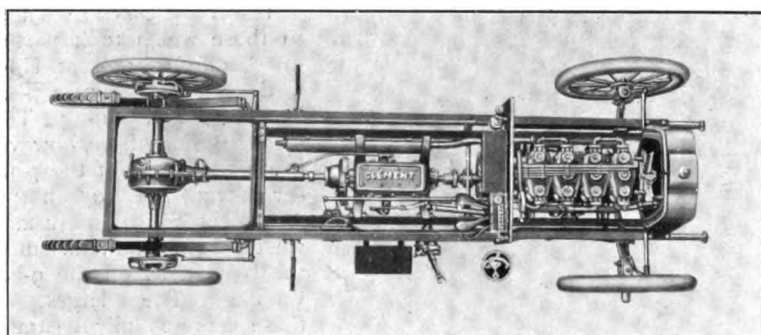


Fig. 1.—Plan view of the 16-20-h.p. Clement Chassis.

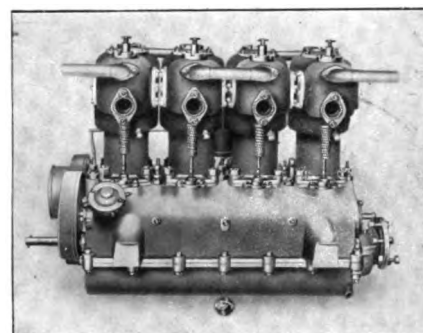


Fig. 2.—View of the 16-20-h.p. 4-cylinder Clement Engine.

4-cylinder vertical type, having each cylinder cast separately, as seen in our illustration, Fig. 2. The bore and stroke are 95 mm. and 130 mm. respectively, while the normal speed is 1,000 revs. per min. The inlet-valves are mechanically operated, and are interchangeable with the exhaust-valves—which are on the opposite side of the engine. The crank-shaft is supported between each crank, so that it has five bearings in all, each of which is lined with white metal. The circulating water is led

tial has also been adopted, instead of the bevel-pinions previously used. Internal expanding brakes are fitted to the rear-wheels, and a striking feature of the chassis are the laminated scroll-spring-hangers employed for supporting the rear ends of the rear-springs. A very neat form of control has also been devised, this taking the form of "bicycle handles" fitted into the rim of the steering-wheel so that, when twisted, they control the throttle and the "tining" through Bowden wires.



THE MADDISON SQUARE SHOW IN NEW YORK, U.S.A.

THERE can be no doubt that the American manufacturers are taking a very serious view of the present international situation of the automobile industry. The "American car" has been a well-known vehicle for some time, but in this country, at any rate, it has been synonymous for that type of vehicle which employs an epicyclic gear in conjunction with a horizontal engine. In the States, however, the Continental practice finds increasing favour, although the Olds and Cadillac cars more than hold their own among the smaller cars, and the latter firm have even gone so far as to employ a three-speed and reverse epicyclic gear on the large 25-30-h.p. car which they have now introduced. The Winton cars, too, maintain their popularity with their clutch-gear mechanism, so that there is, as before, a considerable demand for the "fool-proof" gear.

A good many novelties were to be found in various parts of the show. On the "Northern" car, for instance, the engine is inclined so as to point directly at the back axle, in order to reduce the motion in the Cardan of the propeller shaft. An interesting bevel drive was that which was shown on the four-cylinder Haynes-Apperson car; rollers are employed instead of bevel teeth on the pinion, and the teeth on the bevel-wheel rather resemble those on a coarse-pitch spur-wheel than the commonly accepted variety of bevel-wheel tooth. The variable speed-gear—a feature common to nearly all automobile shows—was this year the Custead mechanism, which is nothing but an adaptation of the ordinary link valve-gear employed on steam-engines, the motion of the variable throw-crank being converted, by free-wheel friction clutches, into a more or less uniform rotary motion of any required average speed.

The question of governor or no governor seems to be a question for much debate among American manufacturers, and finally on this point is anything but apparent. It is interesting to note, however, that the well-known Pope-Toledo firm have abandoned its use altogether, while on the Pierce-Arrow cars it is still retained. The

carburettor, too, is also receiving its well-merited attention, although novelty in this direction could hardly be considered a distinctive feature of the Show. Steel frames for the chassis predominate in the exhibits, although a few firms use the armoured wood variety. The sheet steel underframe, riveted direct to the main frame, appeared to be rather a favourite method of supporting the engine.

As in this country and on the Continent, ball-bearings are finding their way into the gear-boxes of several of the first-class American cars, and on the road-wheels also they are in considerable use, and the Cadillac Company had a car fitted with $1\frac{1}{2}$ in. balls in the rear hubs, which were, in consequence, of rather large diameter. Two novelties in clutches are worthy of mention, namely, the leather-to-metal disc-clutch of the Stevens-Duryea Company, and the cone-clutch on the Columbia vehicle. With regard to the latter, it is with reference to the clutch-operating mechanism that the novelty lies, for the fulcrum of the clutch-pedal is floating, being under the control of a helical compression-spring which is only slightly weaker than the clutch-spring itself. In consequence of this the foot-pedal requires a much longer range, because the clutch is not disengaged until the fulcrum has been pushed bodily forward so that the pressure of the spring controlling it becomes equal to that of the clutch-spring. The result is that the foot-pedal can move a considerable distance from the instant that the clutch-surfaces first come into contact until they are engaged with the full pressure of the clutch-spring.

Air-cooled engines seem peculiar to the American market, and they were again to be seen at the Automobile Show. A newcomer among this type is the Frayer-Miller car, on which the cylinders are cast with air jackets, open at the lower end, through which a large centrifugal fan circulates a current of air. A few radiating blades are fixed in the interior of the jacket to assist the conduction of the heat to the passing air.

THE 20-H.P. BROTHERHOOD PETROL CAR—PART II.

CONSTRUCTIONAL DETAILS.

The Main Frame.

THE complete chassis is shown, both by photographs and by line drawings, in Figs. 1 to 5, which together give a very complete idea of its design, besides clearly showing the relative positions occupied by the various parts. The 4-cylinder engine, and the gear-box, B, are fixed direct to the side-members of the pressed-steel frame, with the main-clutch arranged inside the flywheel, A, between them, in the usual way. The differential-gear is contained inside the gear-box, and the two parts of the countershaft that project from it have jaw-clutch couplings, B¹, introduced between their inner and their outer ends, while the power is as usual transmitted, from their sprockets, by side-chains to both rear wheels.

reinforced in the neighbourhood of the gear-box. The chassis is made in three different lengths, with a wheel-base of 8 ft. 3 in., of 9 ft. 3 in., or of 9 ft. 9 in.—for the “A,” “B,” and “C” models—and the complete weight is approximately 16½, 17½, and 19 cwt., correspondingly. The track, in all cases, is 4 ft. 6½ in., and the only difference in the three models is that the lengthened frame varies the distance between the clutch and the gear-box. The artillery wheels all run on ball bearings of the special “Hoffmann” compound type, and, when fitted with pneumatic tyres, are equipped with those of the following dimensions:—on the “A” model they are 870 by 100 mm., on the “B” model 875 by 105 mm., and on the “C” model 880 by 120 mm. Roughly speaking, the “A” model is intended for tonneau

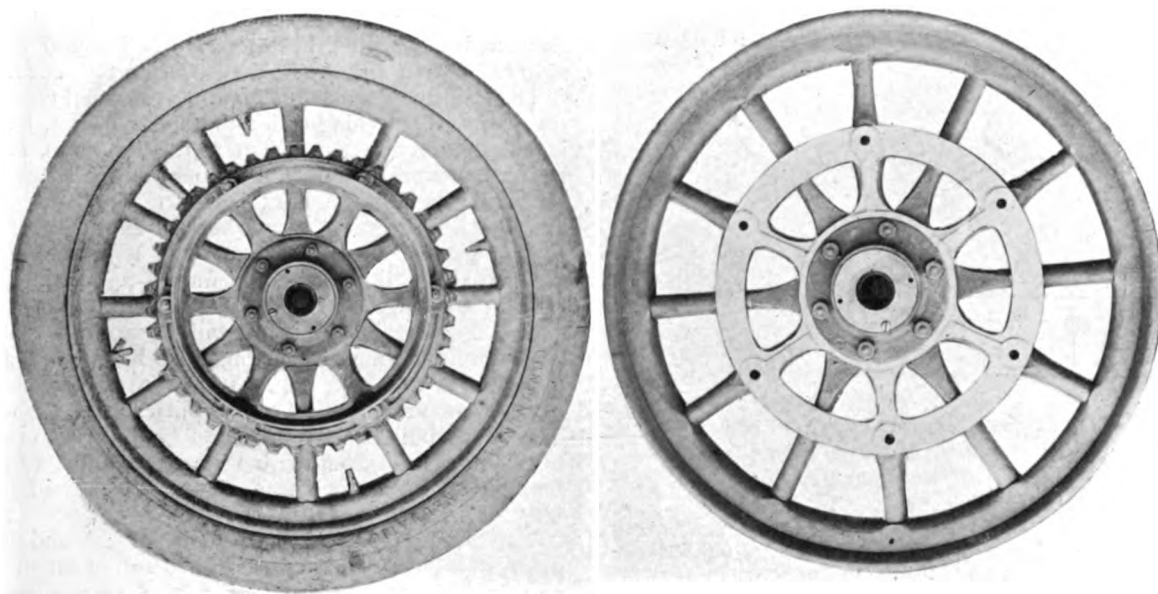


FIG. 8.—Two Views showing the method of attaching the Chain-Wheel to the Hub of the Driving Road-Wheels on the Brotherhood Car. A Wheel complete with its Chain-Wheel is seen on the left, and a Wheel with the metal Driving-Plate for receiving the Chain-Wheel is shown on the right.

Behind the gear-box is fixed, transversely, the exhaust-box, A¹, and right at the back, across the frame, is the (pressure-feed) petrol-tank, A². It will be seen also that the radiator, C, forms the front of the bonnet, and that the main-frame is carried above both axles on semi-elliptic side-springs.

The side members of the frame are curved up at the back, have a tapering cross section, and are bent inwards to give a wider steering-lock in front, and the frame has, in addition to the cross members at each end, two intermediate transverse members—behind and in front of the gear-box; the gear-box is secured to the former of these intermediate members as well as to the sides of the frame, and it is thus rendered a rigid portion of the chassis itself. The front member of the frame is curved upwards at each end—as seen in the front view that we give of the car—thus enabling the radiator to be increased in size, and the starting handle to pass through this member. The side members of the frame are fitted with projecting spring horns at each end, and are

bodies having the door at the rear, the “B” model for cars of the side-entrance type, such as landaulettes, or for six-seated wagonettes, and the “C” model for double side-entrance bodies, accommodating 6 to 8 people, or for 10-seated wagonettes.

The Springs, Axles, and Steering Gear.

The springs are very long and flat, and their special feature is—as we have already said—that provision is made for lubricating them between the leaves. Those at the rear are 50 in. long by 2 in. wide, they have shackles at both ends, and are relieved of the driving strains by adjustable radius rods, which connect the axle with the frame in the usual way. The front springs, which are 36 in. long by 1½ in. wide, have shackles at their rear ends only, and they are fixed so that they project a greater distance behind the axle than they do in front of it. The means adopted for lubricating the springs is well depicted in Fig. 6, which shows:—a complete spring with its oil cups near each end, the same spring with its leaves separated, and—beneath these views—a single leaf

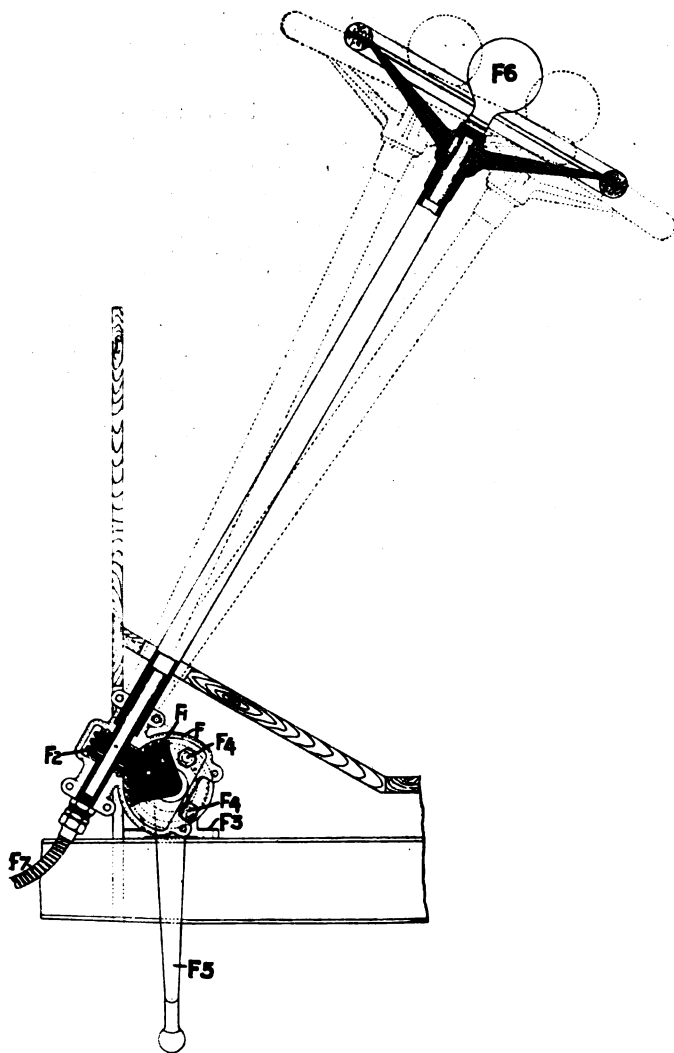


FIG. 9.—Section through the Steering-Gear on the Brotherhood Car, showing the method of adjusting the rake of the Steering-Pillar.

turned up on its side. As will be seen, there are grooves cut centrally down the face of each leaf, and holes drilled through each groove so that the oil can pass down into the groove in the next leaf, with the result that the leaves can be prevented from sticking together—as they tend to do after a time with ordinary springs—and their full resilience can be maintained for an indefinite period. Usually, it is only customary to grease the leaves before the spring is built up, and naturally this grease gradually works out.

Both the rear and the front axles—which are made from solid forgings—are shown in Fig. 7, where it will be noticed that the former is nearly straight throughout its length, and that even the latter has no sharp bends in it. They are, at their ends, turned with a taper to receive the inner members of the compound ball-bearings, and they have their spring brackets formed solid with them. The steering heads are, it will be seen, of the internal type in which the bifurcated portion is in one with the stub axles; they have ball-thrust bearings, are extremely strong, as well as having a neat external appearance. They lend themselves well to being rendered more or less dustproof—for which purpose light casings are fitted around them—and the bearing surfaces all receive

a constant supply of oil from the lubricators that are fixed above them.

The transverse rod that connects the two steering-heads together is arranged behind the axle, instead of in front of it, and is thus, to a certain extent, protected by the axle, while—to further reduce any risk of the steering-gear being interfered with by any large obstacles on the road—the lever arm that is connected with the steering-gear proper projects from above instead of beneath the head.

A section of the steering gear and the steering-pillar is given in Fig. 9 to show the manner in which the degree of slope of the steering-pillar can be varied to suit any individual driver. In the latest design, the steering-gear is fixed just behind the dash, and a removable panel is fitted at the side of the footboard, while the casting, F, which, containing the gear proper, can be rocked about the casting, F³, that secures it to the frame, and the three bolts, F⁴, that fix these two castings rigidly together, can be readily got at at any time. The heads of these bolts lie inside a circular, and undercut, groove in the casting, F, for this purpose, so that when slackened the casting, F, can be rocked round to any required degree, and the bolts then again tightened.

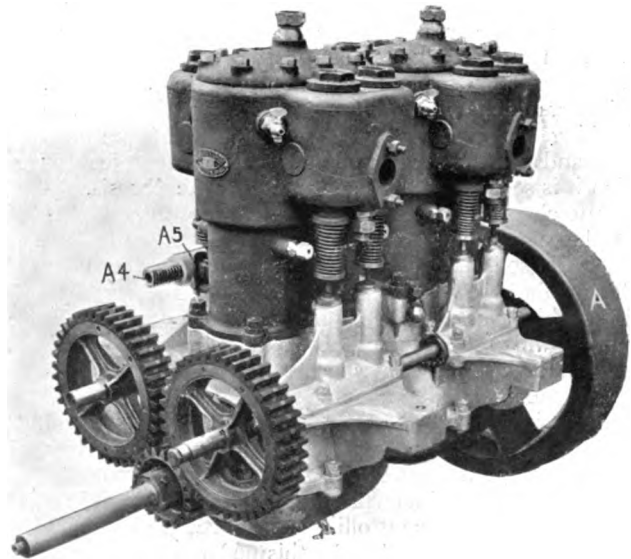
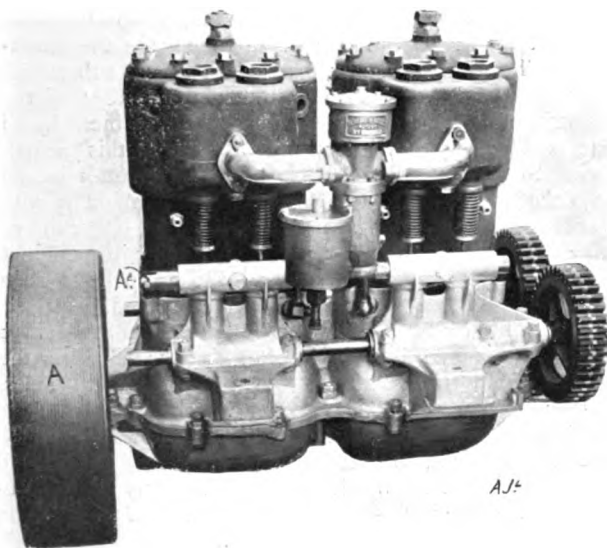
The steering-gear itself is of much the usual type, with the worm, F², meshing with a toothed segment, F¹, that is mounted on the same shaft as the lever-arm, F³. It might, however, be well to point out that the adjustment for taking up any longitudinal play of the worm is arranged above the steering-wheel, at the top, as clearly shown in our sectional drawing. The lever-arm, F³, on the latest cars, lies outside the frame—as seen in Fig. 4—and the connecting rod is quite straight.

In the same illustration, it will be noticed that the central tube forming the steering-pillar has no mechanism of any kind arranged inside it, and that there are no hand-levers fitted either to the pillar or to the wheel. The hooter bulb, however, is connected direct to the top of this tube, and, from the bottom of the tube, a flexible pipe passes to the hooter itself—which is fixed in the front of the car.

The artillery wheels have their spokes and felloes made of acacia, and they are dished to the extent of 3°, and of 6° for the front and the rear wheels, respectively. A special feature of the back wheels is illustrated in Fig. 8, which shows the method adopted for attaching the chain-wheels to the hubs in order to ensure that the chain-wheels shall at all times run true with the axle. A complete wheel, with its chain-wheel, and another wheel without the chain-wheel, are shown alongside one another, and it will be noticed that there is a steel casting that is fixed to the metal hub, and that the chain-wheel registers with, and is bolted to, this casting. The bolts themselves pass through the spokes, but, since the holes in the spokes are slotted, no distortion of the wooden wheel is able to throw the chain-wheel out of alignment.

The Engine.

The engine is shown from three different points of view in Figs. 10, 11, and 12, and, in Fig. 13, the lower portion of it—with the cylinder-castings taken off to expose the pistons—is seen separately. Each pair of cylinders is formed by one casting, in the opposite sides of which the inlet and exhaust-valves lie symmetrically, with inspection-plugs above them. The top of the water-jacket is formed by a large detachable cover. Holes



FIGS. 10 AND 11.—Two Views of the 20-h.p. Brotherhood Engine, showing it, respectively, from the Inlet-Valve and the Exhaust-Valve sides. In Fig. 10, the automatic Carburettor is visible, and, in both illustrations, a portion of the Variable-Lift-Device for the Inlet-Valves can be seen.

are drilled through the walls of the cylinders near the inlet-valve chambers for the ignition-plugs, and there are corresponding holes on the other side of the cylinders to receive half-compression cocks. The water enters the jackets beneath the exhaust-valve chambers, and there are baffles arranged inside the jackets to ensure proper circulation of the water before it finds its way out centrally at the top. The inlet-valves are operated by one cam-shaft, and the exhaust-valves by another, both

these shafts being driven from the same wheel on the crank-shaft by external, fibre gear-wheels. The cams themselves are enclosed, as seen, and the push-rods have large bearing surfaces. A special feature of the engine—although not new—is that the push-rods on the inlet-valve side are fitted with pinions and feed-screws that enable their effective length to be varied while the engine is running. As will be seen in our illustrations, there is a toothed rack, A^4 , mounted horizontally in guides alongside the push-rods, this rack engaging with the pinions, A^3 , on the push-rods, so that the pinions are caused to rotate when it is moved longitudinally. The inlet-valves can thus be caused to open earlier or later, to close later or earlier,

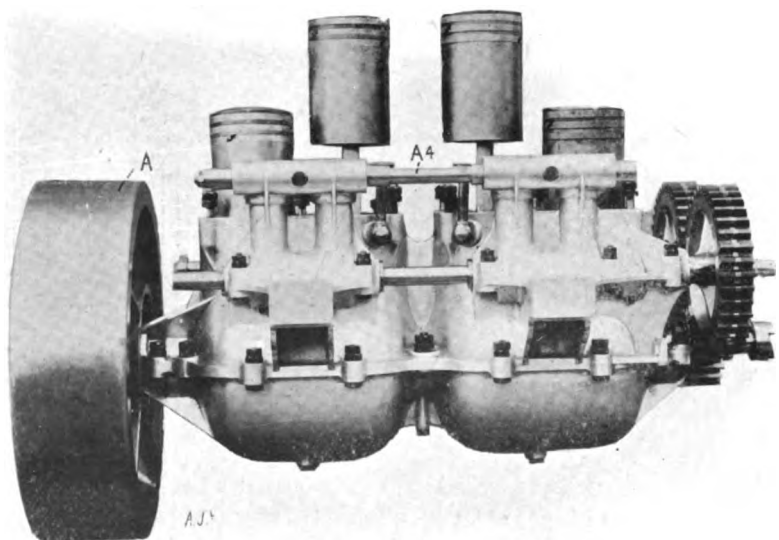
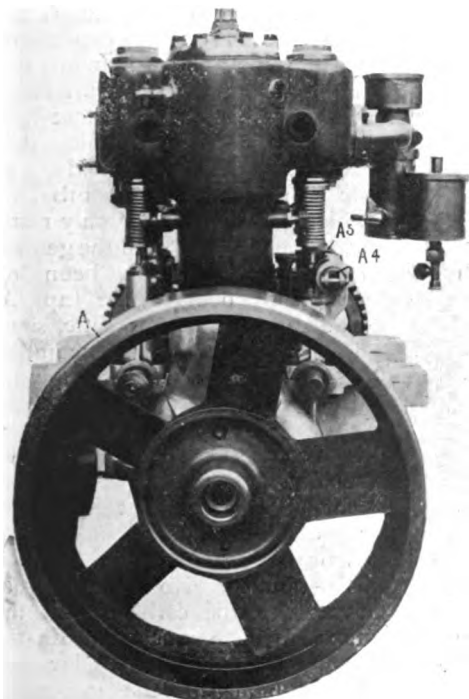


FIG. 12.—View of the Brotherhood Engine from the rear end, showing the Fan Flywheel, Variable-Lift-Device for the Inlet-Valves, and the automatic Carburettor.

FIG. 13.—The 20-h.p. Brotherhood Engine, with the Cylinder-Castings removed to expose the Pistons to view.

and to open to a greater or a less extent, as desired, and thus the quantity of mixture that is drawn into each cylinder during its suction stroke can be controlled by the driver.

The crank-chamber is formed by two castings, with self-oiling main bearings for the crank-shaft between them, and the upper casting has four projecting feet by which it is secured to the main frame of the chassis. A separate chamber is provided for each pair of crank-pins, and the crank-shaft—as also the connecting-rods—are made from solid forgings.

The cylinders have a bore of 4 ins., and the stroke is 5 ins., while the normal engine speed is 900 revs. per min.—at which it is fully capable of developing its normal power of 20-h.p. The flywheel, A, which also forms the external member of the cone-clutch, and has fan blades arranged inside it—is of considerable weight, and, together with the carburettor and the ignition system, permits any speeds between 200 and 1,150 revs. per min. to be effectively maintained. The engine has no automatic governor for controlling its speed, but is solely regulated by the foot-pedal, A³, this pedal being directly connected with the sliding rack, A⁴, that forms a part of the variable-lift device. At the front end of the crank-

shaft a four-jawed clutch is fitted to receive the starting-handle, so that the handle has four distinct positions in which it can at any time be made to engage the crank-shaft. The handle itself is carried in a very substantial bearing that is fixed through the front member of the frame, and is normally held out of engagement by an enclosed spring that constitutes a part of this neatly-designed fitting. As will be seen, the carburettor is held in place by the two induction pipes that connect it with the two cylinder castings, and there is only one exhaust pipe for each pair of cylinders. Apparently, the engines are extremely well-balanced, and those we have seen running seem to work extremely smoothly and silently.

The auxiliary fittings which do not appear in Figs. 10 to 13 are visible in Figs. 14 and 15, which show the engine, from the left and from the right-hand sides, respectively, fixed in place on the chassis.

The connections between the various parts are also rendered evident, so that these illustrations will be found useful in connection with the descriptions of the carburettor, of the water-cooling system, and of the ignition apparatus that we are about to give.

(To be continued.)



THE "DUCELLIER" HEAD-LIGHTS.

THOSE interested in the lamps of their automobiles will do well to secure the new "Ducellier" catalogue from Mons. A. Godin, who has the sole English agency for these goods. It embodies particulars of several new features which have been introduced into these well-known acetylene lamps, of which the chief is the lenticular system, adopted to render them extremely powerful. A very neat form of detachable "carrier" has been devised for holding the lens in place, and it is so constructed that it has the advantage of being adjustable to any size of lamp, and may even be fitted to the older pattern "Ducelliers." Being fastened to the front glass, it comes forward when the front is opened, and in this way allows free access to the interior of the lamp. A very simple method of defining the power of these

lamps has been adopted. Instead of giving the candle power, their capabilities of illuminating the road ahead has been expressed in yards, so that a motorist thus knows what he may expect from his lamp before he buys it.

Fig. 1 shows a section through one of the self-contained lamps, and Fig. 2 shows a drawing of a new type of generator which this company is putting on the market. Referring to Fig. 1, the tap, A, controls the burner, F, the gas having to pass a filter, H, before it reaches the burner. Directly the light is turned out the gas pressure rises in the generating chamber, O, and drives out the water from contact with the carbide, a safety overflow pipe being provided at U. The process of acetylene generation is effected by the water, N, coming into contact with the carbide, B, through the perforated tube, C, which position it can only reach after the air-cushion in the generating chamber, O, has been removed by opening the tap, A. The lamp is thus automatic, since any rise of pressure in the chamber, O, at once reduces the supply by driving back the water.

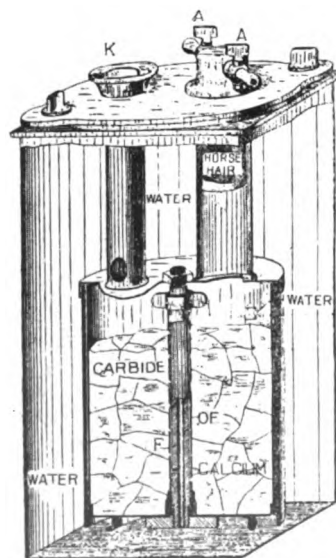


FIG. 2.—The "Ducellier" Acetylene Generator.—Sectional drawing of the new type of Generator which is designed for using ordinary Calcium Carbide.

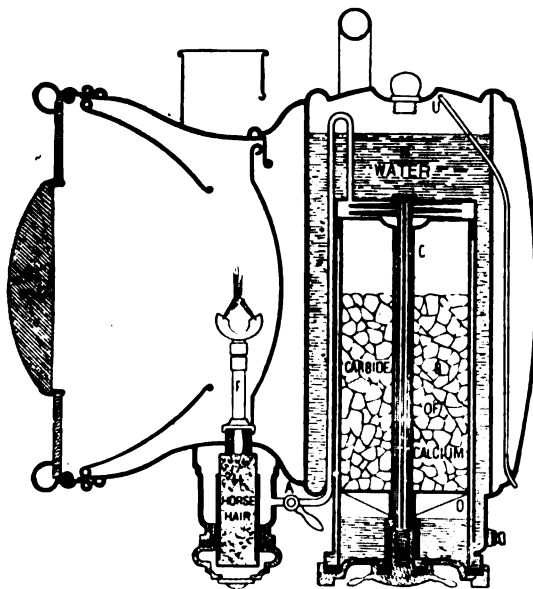


FIG. 1.—The "Ducellier" Head-Light.—Sectional drawing through one of the self-contained lamps, in which the generator is situated immediately behind the burner-chamber.

The generator shown in Fig. 2, is, of course, designed to be carried separately on the car. The water which is poured in at K, attacks the carbide contained in the tin, E, by passing up the tube, F, which is perforated. No water can gain access to the carbide until the taps, A, communicating with the lamp, are opened to relieve the air-cushion in the generating chamber above the carbide. As in the type described above, so this generator automatically controls the water feed, in accordance with the requirements of the lamp.

THE BRITISH EMPIRE MOTOR TRADES ALLIANCE.

UNDER the above title a number of leading British manufacturers of automobiles have determined to found a new society. This course was decided upon at a meeting held on Friday, February 3rd.

The object of the Alliance is to obtain supremacy for the British Empire in the motor manufacturing industries of the world by endeavouring to influence the Automobile Club of Great Britain and Ireland, other automobile clubs and kindred societies, and trade societies within the Empire, to encourage the use in the United Kingdom, the Colonies, and India, of cars built within the Empire.

Membership is to be confined to directors or principals and secretaries or managers (duly appointed by their directors) of

- (a) Manufacturers of motor vehicles, marine motors and agricultural motors made within the British Empire.
- (b) Sole agents for such motor vehicles, marine motors and agricultural motors.
- (c) Manufacturers of motors made within the British Empire for road vehicles.
- (d) Sole agents for such motors.

There are to be associate members, consisting of manufacturers of parts of motor vehicles, marine motors, and agricultural motors made within the British Empire (such as bodies of cars, hulls of boats, tyres, frames, springs, transmission gears wheels, lamps, accessories, &c.); proprietors of journals produced within the British Empire designed to record matters concerning motor vehicles, marine motors and agricultural motors, and others interested in the purposes of the Alliance.

The affairs of the Alliance will, at the outset, be managed by a provisional committee which is constituted as follows:—

Messrs. Herbert Austin (Wolseley Motor Company, Limited), T. B. Browne (James and Browne), S. F. Edge (S. F. Edge, Limited, Napier Cars), E. M. C. Instone

(Daimler Motor Company, Limited), Charles Jarrott (Messrs. Jarrott and Letts, Crossley Cars), E. Lisle (Star Engineering Company, Limited), Hon. C. S. Rolls (C. S. Rolls and Co., Rolls-Royce Cars), Charles Sangster (Ariel Motor Company), Frederick R. Simms (Simms Motor Company, Limited), John Thornycroft (Sir J. I. Thornycroft and Sons, Limited), Honorary Secretary, Mr. Claude Johnson.

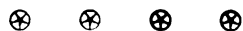
Members or associate members elected prior to or on the 20th February, 1905, are to be founder members. After the 20th February, 1905, a meeting of members is to be called to elect a committee of management comprised of members. Associate members and honorary members are not eligible to be on the committee of management.

The first committee of management is to consist of members nominated by founder members and elected by the members. It is to consist of not more than twelve and not less than eight. Before a member is elected to the committee, the members nominated for the committee will satisfy themselves that the firm which the member represents has sufficient interest in the manufacture, in the British Empire, of motor vehicles, marine motors, and agricultural motors. The first committee is to remain in office for two years, after which a committee will be re-elected annually.

No manufacturer can be represented (either by himself or his agent) by more than one full member. All members, associate members, and honorary members will be subject to re-election annually. Should a member, in the opinion of the committee, cease to be eligible for membership, his membership may be cancelled.

The annual subscription of members is £10 10s., and of associate members £5 5s.

A foundation fund has been created, to which Mr. S. F. Edge and Mr. Lisle have contributed £50 each, Mr. Rolls, Mr. Jarrott, Mr. Sangster, Mr. Thornycroft, Mr. Instone, and Mr. Simms £10 each.



A Reliable Accessory Depot.—United Motor Industries, Limited, have moved their town offices and depot no less than five times in the last few years, owing to the steady growth in their daily increasing business, under the able supervision of Mr. G. H. Smith. The most recent premises are those secured by them at 45-46, Poland Street, W., where they have taken over a fine range of rooms consisting of an entirely new five-floor building. We were able last week to inspect these new premises, and found them particularly compact and convenient for the requirements of the business of the company, and they are exceptionally fortunate in having a grand light. The ground floor is devoted to the storage department, although for many customers it has been found convenient to send a very considerable quantity of goods direct from the makers in France to their destination. The first floor is occupied by a roomy set of offices with a show room in which sample pairs of practically everything marketed by the Company are on view, whilst the second floor comprises another fine suite of offices. The basement is devoted to packing the goods

and to storing lubricating oils. At the premises no manufacturing whatever is done, but ample provision has been made for repairs. Particular attention is given to accumulators, and the company make a point of drawing no distinction between any makes of accumulators. Mr. Watts, a very keen electrician, is in charge of this department, and the repair of induction coils is one which is particularly well looked after by the company, whilst the charging of accumulators for many of the leading London houses is an important branch of the business. Although the company make a speciality of their "Castle" brand of goods, in which the more important items are acetyloid and electric lamps, accumulators, induction coils and horns, practically every accessory necessary in automobilism is stocked by them with the exception of clothing, and they claim that practically every reputable firm in the country is on their books and being regularly supplied. The 1905 catalogue, which is just to hand, gives particulars of the leading articles of the company in great detail. An application for a copy, by those interested, should be made without delay.

CLUB DOINGS.

Derby A.C.—The third Annual General Meeting of the club took place last week at the head-quarters, the St. James' Hotel. The Mayor, Mr. Hart, presided, and an interesting epitome was given by the hon. secretary, Mr. C. J. Allin, of the doings for the past year of the club. The hon. treasurer's (Mr. Leech) accounts showed a satisfactory balance in hand, although it was pointed out that this would probably be nearly absorbed by the cost of the Challenge Cup and the medals. The election of officers for the present year resulted as follows:—President, Mr. G. A. Strutt; vice-presidents, Messrs. J. A. Arnold, Francis A. Bolton, A. J. Clay, Chas. R. Crompton, John Gretton, R. Knowles, Frank Lawson, H. H. Raphael, Chas. L. Schwind, Geo. F. Smith, R. H. Tenant, and Edmund Vaudrey; committee, Messrs. Arundel, Clifford, Copestake, Fryer, Mell, St. John, Sale, and F. Smith; hon. auditors, Messrs. Collumbell and Simkiss. Mr. C. T. Leach, hon. treasurer, and Mr. C. J. Allin, hon. secretary.

Hertfordshire A.C.—The first general meeting of the club took place last week. Mr. Noel B. Kencaley, chairman of the club, presided. The gentlemen who held office during the preceding year were re-elected. The committee is as follows:—Dr. Gruggen, Messrs. A. Hunt, W. G. James, C. Wood, E. Kencaley, E. T. Pryor. The offices of hon. treasurer and hon. secretary have been combined, and Mr. W. Whittall was elected to the combined post. The accounts showed a balance in favour of the club of £26. A dinner was held after the meeting, at which the prizes were presented to the winners of the hill-climbing events, Mr. A. Hunt receiving a silver cigarette case as the winner of the motor-cycle hill-climb, and Mr. F. Coleman received a silver-gilt claret jug for winning the Aston Open Hill-climb on a 10-h.p. White steam car.

Ladies' Automobile Club.—At the last meeting of the committee the following ladies were elected to membership:—Mrs. Breitmeyer, Mrs. Leffreys, Mrs. Todd Newcomb, Mrs. A. Hickman Morgan, Mrs. Alec Waley. Mr. R. Sedgwick Currie's course of six lessons on the internal combustion engine ended on January 24th. These lessons were a great success, and the committee, at the request of the members who were present on the 24th, have arranged for Mr. Currie to give a further course commencing on February 8th. These lessons, however, will be more practical than the preceding ones. At the lesson devoted to the study of gears and gear-boxes a gear-box will be on the table and fully explained. Another day an engine will be taken apart, and yet another lecture will take place in the garage examining a chassis. This course will be free to members of the club, and each member may bring with her one friend provided that 5s. per lecture be paid for such friend. The dates and subjects of the lectures are as follows:—February 8th, Gears and Gear-boxes; February 15th, The Engine; February 22nd, Engine and Ignition; March 1st, The Chassis; March 8th, Steam Cars.

AMONGST the members elected to the Automobile Club this week are:—Sir Thomas Sutherland, G.C.M.G., Sir George Bullough, the Right Hon. Earl of Dunraven, P.C., K.P., C.M.G., Sir Alfred Sharpe, K.C.M.G., Sir John T. Brunner, Bart., M.P., and Lt.-Col. R. Harman.

THE experimental motor omnibus service between Farnham Station and Haslemere Station, Surrey, has proved so satisfactory that Messrs. J. I. Thornycroft, Ltd., of Chiswick, are now running a regular service on this road, two trips each way being made, the journey occupying nearly two hours. Several villages are tapped during the run, and the 'bus passes over Hindhead, thus serving a large residential district which is entirely untouched by any railway system.

ONE of the advantages of this motor 'bus service is that Londoners desiring to have a day in the country, and wishing to visit Hindhead, can leave Waterloo by the 9.10 train for Haslemere, and take the 'bus from Haslemere Station (as it runs in conjunction with this train), lunch on the top of Hindhead, from which point the view is perhaps one of the finest in the South of England, and continue the journey by motor 'bus, reaching Farnham at five minutes to four, and can return to Waterloo before seven o'clock.

MOTOR CYCLING.

Auto-Cycle Club.—The annual hill-climbing competition of the club will this year be an open event, and will practically constitute the hill-climbing championship for auto-cycles. The date fixed is May 6th, and Mr. S. Philipson Stow, of Fernhurst, near Haslemere, has offered the club the use of the hill on his estate for the competition. This hill is 2,000 yards long, with an average gradient of 1 in 11, the steepest part being 180 yards with a gradient of 1 in 8. Mr. Philipson Stow is having the surface put into thorough repair, and, as the hill is in private grounds, there will be little fear of competitors being hampered by crowds of onlookers. This hill will afford an excellent test of the hill-climbing capabilities of motor cycles, and should be the means of finding out what weak points there are (if any) in tricars as regards hill-climbing.

The Motor Cycling Club.—The new committee have already arranged some of the principal fixtures of the season. The opening run will take place on Saturday, March 25th, to Brighton, followed by the usual dinner and social evening. The all-day ride from London to Edinburgh, which was such a brilliant success last year, has been fixed for the second Saturday in June. All who accomplish this great test will receive the club's special London to Edinburgh badge, as well as a gold medal. About the middle of July there will be a 24-hours' ride, with valuable cup for the winner. Other important events already agreed upon are: 200 miles reliability trial, about May 20th; 100 miles passenger trial, probably June 24th; inter-team trial for "The Motor Cycle Challenge Cup," August 26th; Brown cup, September 9th; competition for private members only, that is those not connected with the motor cycle trade, early in the summer, exact date and particulars to be arranged later. In addition to its numerous competitions for valuable prizes, the club holds weekly runs. All applications for membership should be made to the Hon. Secretary, Arthur Candler, 1, Lime Grove, Shepherd's Bush, W.

International Motor Cycle Cup.—The challenges received by the Motor Cycle Club of France, the holders of this cup, are three in number, viz., from the Auto Cycle Club of Great Britain and Ireland, the Deutscher Radfahrer Vereinigung of Stuttgart, and the Oesterreiche Motocyclisten Vereinigung of Vienna.

A NEW department has been created by the A.C. de France to deal with electric traction. M. Krieger is president of this section; M. Leniau (of the Electro-mobile Company), vice-president; and M. Lavezzari, secretary.

FURTHER papers arranged to be read at the Automobile Club during February are:—February 16th, "Touring Experiences in Ireland," R. J. Mecedry; February 23rd, "Motor Boats—Present and Future" (illustrated with lantern slides), Arthur F. Evans.

THE electric tram engineers are attempting to score a move in competition with the internal combustion engine. We and others have proposed that vehicles propelled by internal combustion motors should be employed on the existing horse tram lines. Now the Highways Committee of the London County Council is being assured that it will be impossible to do this, as the running heavy tramway cars "drawn by automotor or other motor" would be impossible without entirely reconstructing the lines, as would be necessary for the overhead or conduit systems. There might be truth in this if the motor propelled tramcars were to be as heavy as the electric tramcars of the London County Council. But who ever suggested that they should be? In any case the reconstruction of the line would not involve the additional expense of laying down a conduit or overhead electric system. It is an example of the style of *bona fides* with which the subject is being discussed by the threatened interests. It is also an eloquent indication of the fright they are in.

RACES, RECORDS, AND TRIALS.



The nature of the dreadful accident to Mr. Frank Croker can be realised from the photograph above, in which his Simplex Car is seen in the sea on the Ormond Beach, after the event which proved fatal both to himself and his chauffeur. A picture of Mr. Croker is seen in our frontispiece this week, and particulars of the occurrence were given by us on page 109 of our issue of January 28th.

Gordon-Bennett Race and Grand Prix.— On February 1st, when entries for the French Eliminating Trials closed, there were 26 entries in all, against 29 last year, four beyond those already given by us. The complete list is: Three cars each Panhard and Levassor, De Dietrich, Darracq, Renault, Mors, Bayard-Clement, Hotchkiss, Richard-Brasier, one C.G.V., and one Gobron. Mons. Serpollet intends reserving his new big racer for Nice, the scene of his other great speed triumphs.

IN regard to running the two races on the same course at the same time, there is strong evidence of an inclination on the part of the A.C. de France to bow to the storm of protests which has been hurled at them by the rest of the clubs. They could hardly persist in the face of such unanimity, and we shall hope to record ere long that they have reinstated themselves as sportsmen in the eyes of the automobile world. We deal elsewhere in our editorial pages with the latest action of the A.C.G.B.I. in respect to this momentous question.

A CHANGE of front on the part of the A.C.F. is at least probable, as, on Monday last, a meeting of representatives of most of the clubs was held at Berlin. The general attitude towards the proposals of the French club was exceedingly antagonistic, and it was decided to formally request the French club to convoke the Gordon-Bennett Commission, so as to enable the various clubs to decide on their action in regard to this year's race.

The Non-Skid Trials at the Crystal Palace.

One of the features of the Automobile Show, held last week at the Crystal Palace, was the trial of non-skids which was held in the grounds under the auspices of the Exhibition authorities. Of the eight devices entered, only six actually took part in the trials, which were held on a short stretch of asphalt pavement thickly covered with a preparation of Thames mud and soft soap. The trials were conducted in a similar manner to those held last year by the A.C.G.B.I., the cars being required to turn, stop, and re-start on the prepared section.

Of the six competing devices, four were of the steel-studded leather-band variety, these being the Samson, Grose, Sawyer, and Watkins, the latter being detachable, while the first three are vulcanised directly to the tyre. The two other non-skids were the well-known Parsons chain and the Empire support, the latter being fitted to a motor-bicycle. As results of the trials the judges, Messrs. Stainer and Swindley, have allotted the following marks for the various performances, and, as will be seen, the first award goes to Capt. Theo. Masui's popular "Samson" band:—

	Turning.	Braking.	Starting.	Total.
Samson ...	10	10	10	30
Grose ...	10	7	9	26
Sawyer ...	5	10	4	19
Watkins ...	0	10	7	17
Parsons ...	5	6	5	16
Empire ...	0	10	0	10

Heavy Fuel Competition.—The contest for motor vehicles using heavy oil for fuel, organised by *L'Auto*, to which we have referred several times, will include both tourist cars and industrial vehicles. The route

between Paris and Rouen has been now confirmed, and about March 15th is mentioned as the date. All competitors must use one particular brand of petroleum, and the classing will be (1) by quantity of fuel consumed, (2) by the total ton kilometre, (3) the regularity of running, and (4) the quantity of petrol used for starting. The average speed must range between 20 kilometres per hour minimum, and 30 maximum for tourist cars, and from 5 kilometres to 20 for commercial vehicles.

Delhi-Bombay Trials.—The following is the official reply by the Judges in this trial, to the protest which we published on January 28th :—

The Motor Union of Western India,

11, Elphinstone Circle, Bombay, January 5th, 1905.

DEAR SIR,—Your letter of protest, dated January 2nd, and addressed to the Judges of the Delhi-Bombay Motor Trials, has been referred by them to the committee of the Union.

In reply, I am instructed to say that the committee uphold the decision of the Judges on all points, and to request that you will be good enough to communicate this decision to the representatives of owners who have signed the letter of protest. I remain, sir,

Basil Johnson, Esq.,

Yours faithfully,

Representative of owners,

ARTHUR HOARE, *Hon. Sec.*

Delhi-Bombay Motor Trials,

Taj. Hotel, Bombay.

5,000 Miles Trial. The Trial Completed.—Since our last issue the official report of the performance of the 12-h.p. Siddeley car is as follows :—

Wednesday, February 1st.—Worthing Road. 148 miles. No involuntary stops. Chains tightened. Carburettor cleaned out. Near side front wing repaired. Accumulators changed. Tool box fell off, and was run over by car.

Thursday, February 2nd.—Folkestone Road. 152½ miles. No involuntary stops. Nut at bottom of carburettor removed and water drained out. Off side driving cover, after running 2,994 miles as front cover and 1,356 miles as driving-wheel cover, removed. Replaced by off front wheel cover, which had done 1,208 miles on front wheels.

Friday, February 3rd.—Brighton, *via* Worthing. 149½ miles. No involuntary stops. Carburettor cleaned out. Feed pressure valve cleaned.

Saturday, February 4th.—Southampton Road. 151 miles. Two stops due to loss of pressure in petrol tank owing to feed pressure-valve sticking through dirt. Distance run since last involuntary stop, 700½ miles. Feed pressure-valve and pipes removed and cleaned. Bottom wing iron on near side broken and removed.

Monday, February 6th.—Exeter Road, 158½ miles. No involuntary stops. New wing iron fitted on near side, 12 mins. Commutator chain tightened, commutator spring adjusted.

Tuesday, February 7th.—Great North Road, 155 miles. No involuntary stops. Fan belt adjusted. Distance since last involuntary stop, 369½ miles.

Wednesday, February 8th.—Total distance covered, 5,000 miles. Total consumption of petrol, 319½ gallons. The off-side driving-wheel cover has now done 650 miles, and the near-side driving-wheel cover 1,892 miles without trouble.

At the conclusion of the run, Mr. Siddeley gave some interesting particulars relating to the cost of the trial, during which, it was pointed out, there were only three really fine dry days when the roads were in a good, hard condition. The costs were as follows :—8½ galls. of lubricating oil at 3s. per gal., £1 4s. 9d.; 327 galls. of petrol at 1s. per gal., £16 7s.; 20 tubes of chain grease at 1s. 3d. each, £1 5s.; ¼ gal. gear oil at 3s. per gal., 9d.; 1½ tins of Belmoline at 3s. 6d. per tin, 5s. 3d.; charging accumulators, 12s.; replacing two air valves at 2d. each, 4d.; repairing two wing stays, £1; cost exclusive of tyres, £19 5s. 1d. = 93d. per mile. Two covers and two tubes were renewed at a cost of £20 15s. 6d. = 1d. per mile. Total expenses, 193d. per mile. The sparking plugs were never changed, and the commutator was only adjusted once.

2,000 Miles Commercial Vehicle Trial.—The 24-h.p. Straker-Squire public service chassis, fitted with trial body, carrying a load equivalent to 25 passengers, and weighing altogether 5 tons 0 cwt. 36 lbs., fitted with Sirdar tyres 2 ft. 8 in. diameter by 4½ in. wide, single, on the front wheels, and 3 ft. 6 in. diameter by 4 in. wide, double, on the back wheels, last week completed its trial of 2,000 miles under ordinary working conditions, and under the continuous observation of officials appointed by the Automobile Club. The daily runs consisted of approximately 100 miles a day, on main roads, starting from and returning to the Automobile Club motor house, where the car was locked up each night after washing, lubricating, replenishing, and making any necessary adjustments in the motor house all under observation.

The observers' reports—extracts from which we have published in the last three issues—have not yet been finally considered by the committee, but a provisional reading of them shows the following results, although it should be understood that such results are not necessarily final or in the form in which they will appear on the club certificate, and it is possible that some of the stoppages mentioned may not be considered as counting against an unbroken run :

Unbroken runs were made as follows :—97½, 309½, 294½, 177½, 101½, 61½, and sundry minor distances with stoppages due to engine stopping on hill, examination of magneto, &c., &c. There were voluntary stops each day for lunch, tea, lighting lamps, &c., and also sundry stops for traffic. The tyres have not been touched throughout the whole period of the Trial, except to remove a few stones.

The chief adjustments in the motor house were as follows :—

Replaced 11 sparking-plugs, 62½ mins.

Adjustments to magneto, 1 hr. 22 mins.

New switch fitted, 44 mins.

Adjustments to foot-brake, 20½ mins.

Adjustments to hand-brake, including fitting new pins in side-levers, 4 hrs. 36 mins.

Adjust length of shifting-rod in back gear-box, 40 mins.

Cleaned exhaust pressure-valve and stopped leak in pipe to pressure-gauge, 53 mins.

Feed pressure-valve cleaned, 10 mins.

Replaced 4 axle caps, 3 split pins in side-chains, 2 split pins in side-brake, and 3 broken gauge-glasses.

Through a great part of the Trial the roads were very heavy.

For the purpose of completing our official record of the daily events of this trial, we give below the reports for the last three days of the run :—

Wednesday, February 1st.—Great North Road. 100 miles. No involuntary stops.

Thursday, February 2nd.—Banbury Road. 100 miles. No involuntary stops.

Friday, February, 3rd.—Bath Road. 96 miles. No involuntary stops.

Distance since last involuntary stop, 309½ miles. Total distance, 2,001 miles. Total petrol consumption, 298 gallons.

Supplementing the official report above, the following figures supplied by Messrs. Straker and Squire are interesting. The work done during the trial equals 52,000 passenger miles, or, taking the gross weight of five tons, 10,000 gross ton miles. This has been accomplished in the total running time of 168½ hours, an average of about 12 miles per hour, with a petrol consumption of 297 gallons, equal to 0.297 gallons per gross ton mile, or approximately seven miles to the gallon. Regarded from the profit-earning point of view, based on one penny per passenger mile, the revenue from a paying load during the period of the trial would have been £216, or over £70 a week. Against this, the firm estimate for working expenses £18 per week. The vehicle, which is equipped with Sirdar tyres, will be on view at the Olympia Motor Exhibition.

A VARIABLE MOTOR-CYCLE GEAR.*

By Professor Callendar.

THE advantages of a variable gear for a motor-cycle, especially when the cycle is required to propel a fore-carriage, are now so generally appreciated that no apology is needed for the description of a gear which has been in continuous use for nearly two years, summer and winter, and has driven a fore-car some 12,000 miles. The external arrangement of this particular gear has been mainly determined by the space available on the machine to which it had to be fitted, and by the parts which could be had ready made.

As received from the makers the bicycle was fitted with chain-drive from the engine to a two-speed gear of their usual epicyclic type giving six and eight revolutions of the engine, respectively, to one of the road wheel. The pedal-gear was 66 in., with 6 in. cranks. In fitting the machine with a detachable fore-carriage, it was found necessary to lower the pedal-gear to 50 in. and to fit 7 in. cranks. The engine gears were also reduced to 8 and 10.5 by fitting a countershaft on the chain stays, and dividing the long chain from the two-speed gear to the road wheel into two parts. Although this increased the total number of chains from three to four, it had the great advantage of diminishing the risk due to excessive vibration of the long chain, and made it possible to fit a chain case which was required to protect the rear chain from mud in bad weather. The extra load and the screening effect of the fore-car also made it necessary to fit a fan on the flywheel, deliver-

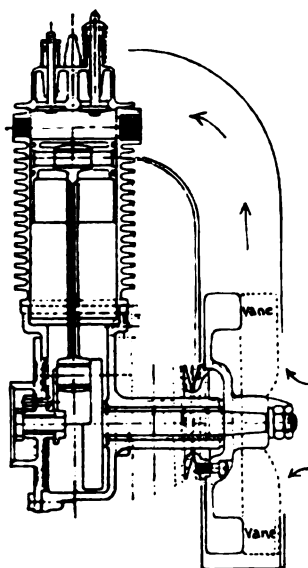


FIG. 1.—Sectional Elevation of Engine and Fan.

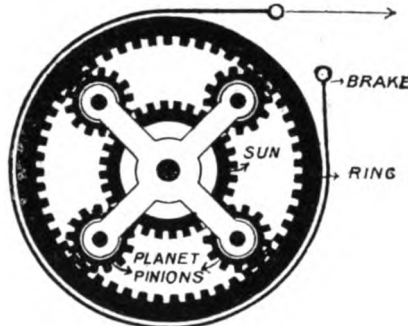


FIG. 2.—Diagram of Epicyclic Gear.

ing a blast on the exhaust-valve, as shown in section in Fig. 1, to enable the engine to run at full throttle for any length of time on a low gear without over-heating.

With these modifications the motor proved capable, with pedal assistance, of taking two passengers almost anywhere on good main roads in fair weather. But the variable gear, though better than

nothing, had obviously much too small a range to cope with adverse winds and mud on country roads in winter; and for want of a lower pedal-gear, the machine was difficult to manage in traffic, or to re-start on a hill steeper than 1 in 20. To explain the way in which these difficulties were overcome it is necessary to describe the particular form of epicyclic gear in somewhat greater detail.

The general principle of the epicyclic gear is well illustrated in the accompanying figure—Fig. 2. A central pinion, called the sun, engages with a number of pinions, called the planets, which are carried by a disc or cross as shown in the figure, and are capable of revolving round the sun. The planet pinions engage with an internal toothed wheel, called the ring, which turns on the same axis as the sun and planets. The advantages of this type of gear are:—(1) The teeth are always in mesh. (2) The thrusts are evenly balanced, which saves friction on the bearings and gives high efficiency. (3) The gears engage at several points, so that great strength is obtained with small teeth and a light and compact gear. (4) On the normal gear the whole revolves solid in one piece without any relative motion of the teeth; on a higher or lower gear the relative motion is still small, so that the wearing qualities and the efficiency are very good.

In a gear of this kind, change of speed may be effected in a great variety of ways. In the particular gear under consideration

the planet pinions are driven by a chain from the engine, and the ring is connected by a chain to the road-wheel. An ordinary roller free-wheel clutch is interposed between the planet disc and the ring, so that, when the engine is driving, the planets cannot overrun the ring. This gives the normal gear, the sun revolving at the same speed as the ring and planets. When the engine is not driving, the ring can overrun the planets freely, so that the machine can be pedalled, or can run downhill, on the normal gear, without driving the engine. In order to obtain a higher gear, a band brake is caused to act on a disc fixed to the sun pinion, so as to hold the sun stationary. This causes the planet pinions to revolve forwards as they go round the sun, and to drive the ring at a higher speed. Since the change is made smoothly by friction, no skill in changing is required, and it is impossible to damage the gears. The ratio of the change of gear is determined by the number of teeth in the sun and in the ring. In the present case the sun and planet pinions are all $\frac{1}{2}$ in. in diameter, with 20 teeth, and the ring has three times as many teeth as the sun, so that the ratio of the two speeds is 4 to 3. More generally, for any conditions, if r and s represent the revolutions of the ring, planets and sun respectively, we have the following simple relation between them:—

$$3r + s = 4p.$$

This makes it easy to calculate the relative speeds of the various members of the gear. Thus, if the machine is stationary, $r = 0$, and $s = 4p$, or the sun must revolve forwards at four times the speed of the planets. Again, if $p = 0$, or the engine is stationary, then $s = -3r$, or the sun must revolve backwards at three times the speed of the ring.

(To be continued.)

MOTOR FUELS.*

By Dr. Ormondy.

IN the lecture which I gave before the Automobile Club of London, I dealt with the subject from a purely technical point of view, my object being a necessary one, namely, to prove that alcohol was a fuel which was suitable for use in motor cars; and I did not intend, and did not endeavour, to go much beyond that. In the lecture at Lincoln my object was to prove, first, that alcohol being a suitable fuel for motor cars, it was a subject that was worth the time and study of an agricultural community in order that they should find out in how far it was suitable, in connection with their particular industry, and Lincolnshire, being a potato-growing county, I thought that that aspect of the question would prove of interest to them. To-night, however, I propose to deal with the subject on the very broadest lines. The question of motor fuels is one which must be of very great interest to us, and is of vital interest to the industry of motor manufacturers. It seemed to me that the best way to treat the subject to-night would be, first of all, to discuss on broad lines what is the nature of an ideal motor fuel; secondly, in how far the motor fuels which we generally use, and which we might use, come up to that ideal; and, in the third place, to examine those motor fuels from an economic standpoint.

With regard to the ideal motor fuel, it should possess, in the first place, the largest amount of heat possible, and, in the second place, we should ask, what percentage of the heat that there is in a fuel can we convert into actual work? Then there are a number of practical questions—what, for instance, is the volatility of the substance? Fuel, which is not too volatile, is preferable to one which is very volatile, and for the following reasons:—A volatile fuel means one which is liable to rapid evaporation, which increases the danger of fire, for instance, and you must remember that we are dealing now not only with the question of fuel for land motors, but for marine motors, which, I think, will in the future become of very much greater importance than they are at present. Therefore, the question of the volatility of the fuel and the fire danger accompanying it are of importance, and must be taken into consideration. Another point is its homogeneity. Other things being equal, that fuel which is the most nearly homogeneous—that is to say, which will vary least in its properties—will be the one that is most suitable for use by motorists. Obviously, the difficulties in designing a carburettor are tremendously increased if you have a fuel, the first portion of which is exceedingly volatile, and is liable to be easily removed, and the residue of which is not at all volatile, a difficulty which was very keenly felt by those who used the old surface carburettors. The residue which is left is known as stale petrol, which is very difficult to deal with. It is considered that the spray car-

* Abstract of a paper read before the members of the Auto Cycle Club, on Wednesday, February 8th, 1905.

* Abstract of a Paper read before the Scottish A.C. (Western Section), on January 30th, 1905.

burettor has overcome this difficulty to a considerable extent, but, although it has minimised the difficulty, it has by no means entirely removed it. Another point is that the proper fuel should not, so far as possible, possess the property of being split up into other compounds of a deleterious nature. It is a property of chemical compounds of carbon and hydrogen that if they are burned or heated in a condition where they get a minimum or not sufficient quantity of air, they are subject to a sort of condensing action. A portion of them is burnt, and the residue left behind is of a tarry nature. I think that any of you who have had the pleasure of driving a motor car up a steep hill with a spray mixture and have got short of air will realise the fact that these tarry products are produced, and that they occasionally get on to your sparking plugs and other parts of the mechanism of the engine. That again is a drawback which the ideal fuel should not labour under. Then, there is another point, and that is the amount of heat which is necessary to vaporise a fuel. Few of us realise that a considerable amount of heat is spent in vaporising the fuel which we use in the engine. Those of you who have suffered from what is known as a "frozen-up carburettor" will realise that a great deal of warmth is absorbed in the evaporation of petrol in the conversion of it into gas in the making of the explosive mixture for use in the cylinder. I had the pleasure a few days ago of seeing a trial of an engine where precautions had not been taken to warm the carburettor sufficiently, and in the space of about four minutes a cake of ice about a quarter of an inch thick was formed in the tube leading from the carburettor to the cylinder. I do not wish to convey the impression that a motor fuel is the worse because it requires a lot of heat to convert it into the form of a gas. In an internal combustion engine we always have a large amount of heat going to waste. There is all the heat which is carried away in the exhaust, all the heat which is carried away in the cooling water circulating round the cylinder, and that may very well be made use of. It is distinctly an economy if you can make use of it and spend it in vaporising the fuel, which fuel without that heat would be possibly useless, but which when so heated becomes a very good servant when it gets inside the cylinder. Therefore I say that the subject of the heat of evaporation of a motor fuel is an important one, but I do not wish to convey the impression that a large heat of evaporation is by any means a bad thing. On the contrary, if you can use what would otherwise be waste heat to vaporise that fuel it is going to be a distinct economy. Then the question of the range of explosibility of a motor fuel when mixed with air is another point which is of vital importance to the motor industry—to the elasticity of the internal combustion engine. I think it is pretty fairly obvious that if a fuel is explosive when mixed with (x) volumes of air, and when mixed with (2 x) volumes of air; but with less than (x) volumes or with more than (2 x) it is not explosive, it means that our carburettor must be so carefully and accurately designed, if we would have no waste of fuel, that at all ranges of speed the carburettor shall always take into the cylinder somewhere in the proportion of 1 part of fuel to (x) or (2 x) parts of air—neither more nor less. If we can get a fuel which gives a good explosive mixture between (x) volumes of air and (5 x) volumes of air we have gained a very great deal, and for this reason: the makers of the modern petrol engines endeavour more and more to run their engine with the elasticity of a steam engine. They wish it to be capable of running at four miles an hour and at forty miles an hour without changing gears, and they endeavour to do that in one of two ways. First, they may weaken the mixture, and secondly, they may throttle down the mixture. Throttling is mechanically bad practice. It is bad because it causes negative work. The gas has to be sucked into the cylinder, and it is uneconomical to run an internal-combustion engine with gases which are not under the maximum compression at which the engine is able to work. The greater the compression you can use, the more efficient your engine will be, and, therefore, within the range at which your fuel when mixed with air is explosive it is more economical to alter the percentage of fuel to air, or air to fuel, and keep your compression as high as possible. That is to say, don't work with the throttle; have your carburettor so arranged that it will give you a weaker or a stronger mixture as you desire it, and don't use the throttle until you have got a mixture at such a stage of weakness that to weaken it any more would mean non-ignition or miss-firing in the cylinder. Therefore, I say that the fuel which has the widest range of explosive limit when mixed with air is the one which is most nearly ideal from our point of view as users of internal-combustion engines. Then, for another reason it is of importance that the range of explosion should be as wide as possible. If it is not wide you are always tending to run your engines without having complete combustion. Incomplete combustion means, as a rule, dirty sparking-plugs, choked exhausts, and foul-smelling exhausts. I have treated thus shortly, but I hope sufficiently clearly, with those properties which we would like to have in a fuel which we could characterise as being as

nearly as possible ideal for the purposes for which we require it.

Now let us examine the fuels which are in common use, and see in how far they fulfil these requirements. In order to render the whole subject more easily comprehensible it would be best to treat with the three fuels, with which I wish to deal to-night, in parallel. We will take them in parallel for each individual property, and then we can compare them as regards each property. In the first place, the fuels which I wish to deal with are petrol, benzol (benzene), and alcohol. By benzol I do not wish you to consider that I am dealing with the chemically pure substance benzol. For motor purposes a chemically pure, or even approximately pure, benzol is absolutely out of the question, its market value being far too high, and the quantities of it produced far too small. I wish you to understand by benzol the commercial mixture of benzol, toluol (toluene), and xylo (xylene)—known more widely as crude naphtha—that is to say, naphtha which has had the naphthalene and the sulphur compounds extracted, these being things which would instantly cause the stoppage of the carburettor, and which must be removed in any case. The substance known as solvent naphtha is the one which the trade will likely wish to foist upon us. The manufacturers can sell their benzol, but it is not so easy to sell their solvent naphtha, and they are anxious to find a market for the latter; hence, that is the substance which they would like us as motorists to use, and that is the subject with which I shall deal in my remarks to-night.

As regards heat contents, we may consider, roughly speaking, that petrol and benzol are equal. The heat of combustion per unit of weight of these is 10,200 or 10,250 units, while alcohol compares exceedingly badly at 5,500, very little more than one-half. In so far then as regards the heat contents per unit of weight, benzol and petrol are far in advance of alcohol, but what is of greater importance to us is the question, what percentage of the heat that there is in the fuel can we get out in the form of mechanical energy? What is the co-efficient of energy which we can make out of this heat contained in the fuel? An engine designed for use with petrol is not ideally suited for use with alcohol, but it is about right for a mixture of alcohol and benzol in equal quantities. What is then the heat efficiency of a petrol engine, generally speaking? On full load, under good conditions, working on a brake test—not a road test—you are doing very well indeed if you get 20 per cent. of the heat value of the fuel in the form of work on the flywheel, which is a fairly poor result, though high as compared with the efficiency of a steam engine. With regard to alcohol the efficiency is from 30 to 30½ per cent. under the same conditions. I am speaking now of an engine run under the most favourable conditions, full load, and at the speed which gives the best horse-power. Under half load the petrol engine falls off abominably, its efficiency dropping very greatly. Alcohol drops even more if you don't take a certain precaution, a precaution which is a very simple one, and one which, as a rule, there is no difficulty in ensuring, namely, keeping the jacket of the engine at something like the boiling point of water. Under these conditions the alcohol engine gives a vastly higher efficiency than the petrol. Now the reason I wish to impress this point on you is that I know the majority of you will admit that it would be an advantage to have an engine which gave far better results if the cylinder got hot than if it were cold. The difficulty at present is not to keep your cylinder hot but to keep it cool, and if you knew that you had got an engine that would give you a better efficiency when your water is nearly boiling, I do not think you would be inclined to grumble much. There is another reason why this efficiency of alcohol as compared with petrol and benzol at a light load should be of such great importance, and it is this, that more and more the modern petrol engine tends to be an engine which for 90 per cent. of its time is run with a very light load. There is an ever-growing tendency to use engines with high power which for a very large part of the time are run in a throttled-down condition. Under these conditions alcohol shows up exceedingly well, and under these conditions hydrocarbons, such as benzol and petrol, show exceedingly badly. Admitting, then, that the efficiency of an alcohol engine is 50 per cent. greater than that of a petrol engine under the conditions of full load, and that it is, more than this, much better under a light load, one must admit that, so far as regards efficiency, the alcohol engine is far and away in front of the petrol engine or the benzol engine.

The next question is as regards range of explosibility, and here again I am glad to say that the alcohol engine shows a vast superiority. The range of explosibility of alcohol and air is at least double that of petrol and air. That means that over twice as large a range you can govern the speed of the engine and the power which you wish the engine to develop by simply altering your mixture, and not until you have reduced the power to something like 25 per cent. of the maximum is it necessary to begin throttling. This is a very great advantage so far as flexibility and economy in the use of fuel are concerned.

(To be continued.)

MOTOR BOATING.

Calais to the Thames.

—Difficulties in respect to authorisation by the authorities controlling the traffic on the Thames appear to be arising in regard to the race for motor boats between Calais and London. Various points for the termination of the race have been suggested, including Gravesend and Greenhithe. In all probability, however, the finish will have to be considerably further down, viz., at Margate or Ramsgate.

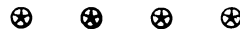
AN active season in British waters may be anticipated this year for the increasingly popular pastime of motor boating. The Marine Motor Committee of the A.C.G.B.I. are considering the details for a programme. It is proposed that the Motor Boat Trials should inaugurate a "Motor Boat Ten Days." The trials will commence on Monday, July 10th, and last till Thursday, July 13th, the runs being in Southampton Water as before. On Friday, July 14th, any boats present will race from Southampton to Calais, a distance of about 130 miles. They will arrive in Calais in time to take part in the race from Calais to the Thames being organised by the Automobile Club de France, on Saturday, July 15th. On the Sunday it is hoped that the boats will come in procession up the river, and be exhibited, say, at Richmond. On Monday, July 17th, it is proposed to hold a gymkhana and fête in the neighbourhood, and on Tuesday to race from London to Brighton. They could lie for the night either at Newhaven (8 miles) or Shoreham (4 miles), and on Wednesday, July 19th, further races will be held off Brighton in conjunction with the speed trials which are down to be held at that date. The above forms a very attractive and interesting programme, but is, of course, entirely dependent upon the weather, but it is hoped that valuable prizes will be offered, and a very large entry should be received.

FOLLOWING the Ormond-Daytona Beach Races for cars, a three-days' programme for motor boat racing, commencing on February 1st, took place on Lake Worth, at Palm Beach. In the racing section, Mr. Gould Brokaw's "Challenger," driven by Mr. Proctor Smith, carried everything before it. In the 4 miles handicap, "Challenger" started scratch, and won in 8 mins. 41½ secs. against G. Downey's "Comet" (2 mins.) 12 mins. 14½ secs. and H. O. Thompson's "Grant Ferris" (5 mins.) 14 mins. 15 secs. The Bingham Cup Handicap also went to



Throughout the British Colonies the possibilities of automobilism in all its phases are vastly appreciated, although in many countries there are difficulties in the way of its introduction to any large extent at present. In Australia, however, it is making rapid strides, and in our photograph above is shown one of Messrs. Merryweather and Co.'s Motor Chemical Fire Engines, which is in use by the Sydney Fire Brigade. Station Officer Jackson is standing in front, and Driver Jackson is at the wheel. This machine is of 20-h.p., has a chemical cylinder of 60 gallons capacity, for use with a hose 180 feet in length. A speed varying from 20 to 30 miles per hour can be easily maintained.

"Challenger" in 11 mins. 59½ secs., and in the speed trials over the kilometre and mile, for the former "Challenger" was first in 1 min. 21 secs., and for the mile in 2 mins. 11½ secs. On the last day, she bettered this by covering the mile with the wind in 2 mins. 4 secs., and against the wind in 2 mins. 6 secs., both world's records. For the 8 miles race, including one turning, "Challenger" was timed for 16 mins. 33 secs. This very fast vessel, it will be remembered, is fitted with a 150-h.p. Simplex motor, a similar type of engine to that fitted in Mr. Croker's car, which came so utterly to grief at the Beach races.



Shaft-drives with Stationary Rear-axes—Referring to the diagrams which we published—on page 46 of our issue of January 14th—in connection with the Paris Salon, for the purpose of demonstrating the principal forms of live-axle-drive adopted by those firms who make a practice of also using a stationary rear-axle, Messrs. De Dion Bouton, Limited, point out that the form illustrated as No. 2, accredited to the Pilain car, is identical with that employed on the De Dion Bouton heavy vehicles, on which it has been in use for some considerable time.

THE Earl of Dartmouth, one of the recent converts to automobilism, has selected one of the latest patterns of the 20-h.p. Daimler carriages for his use, to be fitted with a special covered carriage body.



To meet the growing demand that there is for light delivery vans propelled by petrol engines, the Hozier Engineering Company have introduced the "Argyll" model seen above. It has a twin-cylinder Aster engine, which is capable of developing about 13-b.h.p., is fitted with a large honeycomb radiator, through which the air is drawn by a fan, and the change-speed-gear is of the well-known "Govan" type. The wheel-base and track are 8 ft. and 4 ft., respectively, and the available space in the body is 5 ft. 5 ins. long, by 4 ft. 9 ins. high, and 4 ft. 2 ins. wide, while the complete weight of the vehicle is about 16 cwt. The front wheels have Michelin pneumatic tyres, but those on the driving wheels are of the 3-in. Sirdar solid rubber type; the wheels are all 30 ins. in diameter.

THE Universal Lights on Vehicles Bill is to be pressed strenuously upon the attention of Parliament during the forthcoming Session.

MR. BASIL H. JOY, we regret to learn, has resigned his position as head of the Technical Department of the Automobile Club.

WE are informed that a writ has been issued at the instance of Milnes-Daimler, Ltd., and the Daimler Motoren Gesellschaft against the Motor Traction Company, Ltd., for slander of title.

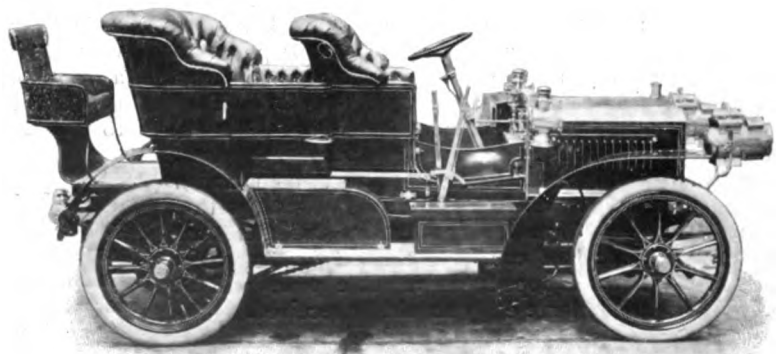
PADDINGTON BOROUGH COUNCIL is seriously exercised in regard to the new regulations for heavy motor traffic, and the effect which they will have upon the roads and traffic throughout London. They are now organising a deputation to Mr. Walter Long, in the hope of their views being considered.

A STATEMENT has appeared in a daily contemporary to the effect that Mr. R. T. Kingham, the Secretary of the General Omnibus Company, has declared that his directors have decided to set apart the sum of £20,000 for experimenting with motor omnibuses. We thought that the period of experimenting was practically past, and that the Omnibus Company had decided on the type that they would adopt, so that there is apparently some mistake in regard to this statement, and the £20,000 is probably intended for development rather than experiment.

WE learn, as we go to press, of a very important change which is to take place in the Siddeley Autocar Company. The Wolseley Tool and Motor Car Company have purchased the Siddeley Autocar Company, and will now control the sale of these well-known cars as well. Mr. J. D. Siddeley, who is such a very prominent figure in the automobile industry, joins the Wolseley Company to take entire charge of the sales department of the company.

THE Motor Van and Wagon Users' Association are holding a luncheon on Tuesday, March 21st, at the Hotel Cecil, to commemorate the issue of the Heavy Motor Car Order by the Local Government Board. Tickets, price 15s. inclusive, can be obtained by those interested from the secretary of the Association, at 16, Down Street, Piccadilly.

The Motor News, the only existing Irish automobile publication, appearing hitherto fortnightly at threepence, has, with the present month, commenced to be issued weekly at one penny. *The Motor News* is edited by Mr. R. J. Mecredy, who is so universally esteemed throughout the automobile and cycle world, and all automobilists will no doubt join in wishing our contemporary a very successful future in its new phase. *The Motor News* was originally founded in February, 1900, as a monthly. In August, 1903, it was issued fortnightly. Under Mr. Mecredy's guidance the articles are always interesting and amusing, whilst a large amount of fundamental knowledge can be obtained by the novice in automobilism from the perusal of its pages. The present number is particularly strong in the matter of chatty and entertaining paragraphs, and the humorous features are conceived in a very happy vein.



Many private owners of cars drive their own vehicles for the love of the sport, although at the same time finding it convenient to carry a chauffeur for the purpose of any minor matters which may arise during journeys and for looking after the car after the day's run. In such cases a difficulty naturally arises in most cases in regard to a seat for the chauffeur, who must either ride alongside the driver, or take up a position in the tonneau with the guests. Messrs. S. F. Edge, Limited, have recently therefore endeavoured to meet this difficulty, and have built a 24-h.p. Napier with a body, as seen in the above photograph, whereby the chauffeur is accommodated with a seat at the back in a small dickey.



The New De Dion 15-h.p. 4-Cylinder Car for 1905. This is the first of the type to arrive in Great Britain.

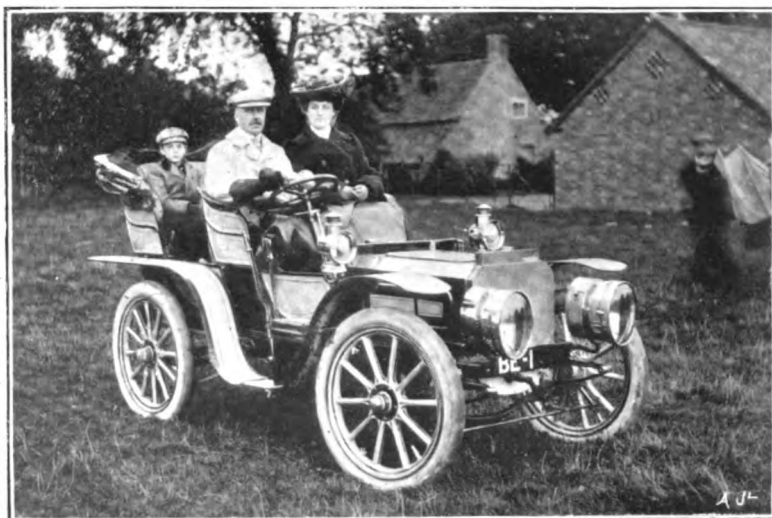
THE new De Dion cars, which we have recently illustrated so fully, are proving in practice to be even an improvement on previous models. Mr. J. W. Stocks, who looks after the business of De Dion Bouton, Ltd., in Great Britain, drove one of these cars, the identical one seen in our photograph, and the first of its type in England, continually during the Paris Show, and subsequently travelled with it from Paris to Boulogne, driving also up from Folkestone to London just before Christmas. During the Christmas holidays a trip to Yorkshire and back, and various other runs, were indulged in, and in the ordinary requirements of his business, Mr. Stocks has since been driving the same car to the Birmingham Show and back, and two or three times to the south coast, in addition to numberless trial rides, totalling up to a distance estimated altogether at about 2,000 miles. Mr. Stocks has, therefore, not unnaturally drawn our attention to the fact that the machine, beyond the usual cleaning and oiling up, has not been even examined. The new patent disk clutch appears to be working well. It has not been examined inside since being put on the road, and although there is, as our readers will remember, a means of adjustment provided, no need for making use of it has been as yet experienced. The gears are easy to change owing to the lightness of the disk member when the clutch is disengaged, and there is no difficulty whatever in starting the car gradually on the top gear with a full load on the level. Full details of the mechanism of the car were given by us in describing the latest De Dion models recently.

QUEEN MARGHERITA of Italy visited the Turin Automobile Exhibition twice during last week.

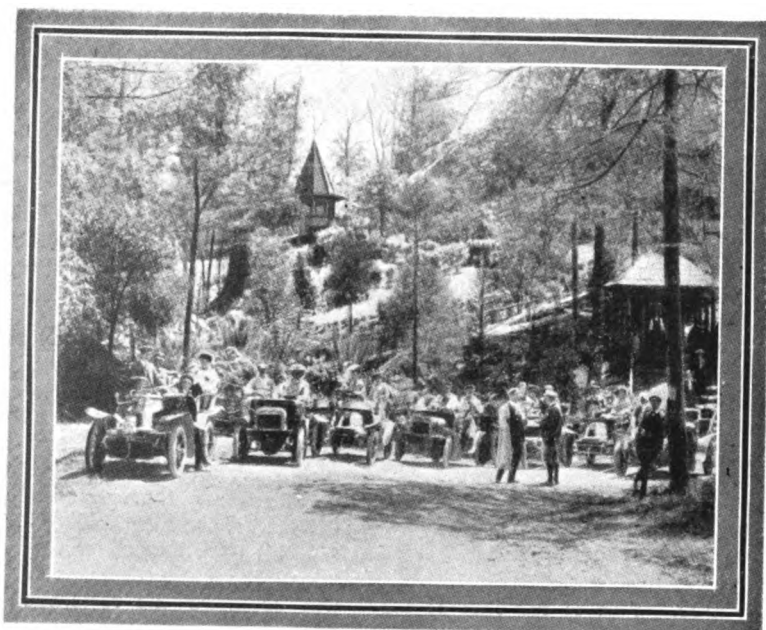
AN annuity of £3,500 has been granted to Sir Francis Jeune upon his retirement from the Presidency of the Divorce and Probate Division, recorded by us last week. Sir Francis, who, we are glad to learn, is much better in health, proposes to take the title of Lord St. Helier upon his elevation to the Peerage, St. Helier, Jersey, being his native place.

ALL automobilists acquainted with Major Lindsay Lloyd, who has done such splendid service for the automobile industry, will be gratified to learn that he is now so far recovered from the very severe illness through which he has passed as to be able to take a sea trip to Gibraltar. Everybody will join in hoping that this journey will complete his restoration to health.

It is satisfactory to find Mr. E. Glossop Such, the chairman of the committee of the Cab Drivers' Benevolent Association, discussing the advisability of cabmen learning to become motor drivers with a view to maintaining their place in the future, using almost the same language as we have ourselves adopted in discussing the subject editorially this week. "The cab drivers," says Mr. Such, "are an intelligent body of men, and with their knowledge of our London streets and skill in driving should make good chauffeurs." He would impress upon them "to take every opportunity they possibly can to learn to drive motor cars—for they have come to stay."



Mr. Joseph Chamberlain on the occasion of his great meeting at Gainsborough, recently, was entertained by Mr. J. D. Sandars, D.L., J.P., at North Sandfield. Mr. Sandars who is seen at the wheel of his 16-h.p. Peugeot Car in our photograph, is an enthusiastic motorist. He is an Ex-High Sheriff of Lincolnshire, and a Vice-President of the County Automobile Club. On the occasion of the meeting referred to, motor cars played a prominent part for the conveyance of large numbers of people from many of the outlying districts.



The Automobile Club of Victoria, Australia, is a particularly active body of automobilists, and in the middle of December last they held their second official outing to Marysville. During the run, a famous hill, known as the Blacks' Spur, had to be ascended, thereby testing the whole of the cars engaged in a particularly severe manner. Our picture, which we reproduce from the "Scientific Australian," is an interesting souvenir of automobilism at the Antipodes. Reading from left to right the cars and their occupants are as follows:—

12-h.p. De Dion.	7-h.p. Swift.	6-h.p. De Dion.	7-h.p. Swift.	10-h.p. Argyll.	8-h.p. De Dion.	Decauville.
Mr. S. Stott.	Mr. and Mrs. Mrs. Kellow.	Mr. C. J. and	Mr. W. E. Cor-	Mr. and Mrs. Mr. T. Rand.		
Mr. C. A. Proc-	J. G. Coleman.	Mrs. W. J.	Mr. H. Roesz-	lett.	Day.	
tor.		Proctor.	ler.	Mrs. Rand.		
Mr. and Mrs.				Mr. Ross.		
James.				Mr. C. B. Kellow,		
				Mr. W. J. Proctor.		

In spite of the London County Council's devotion to tramways, that body is not altogether blind to the advantages of the automobile, and in accordance with the resolution passed last November, quotations have been obtained, and a recommendation put forward that two motor cars of 24-h.p. were to be hired at £15 8s. od. per week for the use of the officials. At a recent meeting this proposal has been referred back on the ground of extravagance. The permanent use of two motor cars at this figure per week can certainly not be regarded as extravagant, and as it has been stated that a recent rapid and opportune visit by the head of a department to a certain work now in progress resulted in £2,000 economy to the Council, it is obvious that the County Council's service is just one in which rapid locomotion is likely to prove really valuable.

Continental Solid Tyres.—The Continental Caoutchouc and Guttapercha Company are bringing out a solid tyre on the cross-wire principle, which construction has proved so satisfactory in the United States as well as on the Continent. The tyres are made in sections of 2½ ins., 3 ins., 3½ ins., 4 ins., 5 ins., 6 ins., and 7 ins. The 7-in. tyre is suitable to carry 8,000 lbs. per axle. Up to the present the tyres have had to be fitted at the works in Hanover, but the C.C. & G.P. Company are making arrangements to have them fitted in London.

TURIN AUTOMOBILE EXHIBITION, which has now closed its doors, has proved an enormous success. Amongst those who have secured gold medals in connection with their exhibits are the Fiat Company, Croizat (representing the Oldsmobile Company), De Dietrich, Titrckheimer, Itala, etc.

AN effort is about to be made in Guernsey to introduce a motor omnibus service which is not without interest. Barring a stretch of land on the eastern coast, which is practically level, the remainder of the area of the island is a series of hills and small valleys. The gradients, more especially as regards the outlets from the town of St. Peter-Port, which is the centre of business, are short, but severe. One vehicle has already arrived.

ON Saturday last, the Berlin Automobile Exhibition was inaugurated by the Emperor William. The Kaiser arrived before noon, and the visit occupied fully an hour. The Emperor wore the uniform of a Colonel of the White Cuirassiers, and was accompanied by Prince Henry of Prussia. The Duke of Ratibor headed the Reception Committee, and Baron de Zuylen, after being formally presented to his Majesty, presented him on behalf of the A.C. de France with the Gold Medal of the French club, which was duly accepted by the Kaiser.

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CORRESPONDENCE.

* * The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

DELHI-BOMBAY TRIALS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—In view of the various statements which have appeared in connection with the above Trials, and particularly in regard to the awards of the judges, the extracts set out below from a letter received from Mr. W. Sorel, the owner of the De Dietrich car which won the Trial and the Gaekwar's Cup for reliability, will be of interest.

"After the results were given out a protest was signed and sent to the judges against the De Dietrich car, as she had actually lost a few marks. The matter was again reconsidered but the award maintained, as no repairs or readjustments had been made on my De Dietrich car after leaving Delhi until arrival in Bombay, whereas all the other cars had been worked on and the engines and other parts readjusted beyond the two hours allowed for cleaning and lubricating. The De Dietrich was consequently considered by the judges to have been the most reliable throughout the run. The only troubles I had during the 880 miles were:—First day, the little pipe leading from pump to water manometer broke and I lost all the water and had to wait 21 minutes for coolies to bring water to replace it. In the same afternoon an ignition tappet-spring broke and was replaced in 4 minutes.

"Fifth day, bad tyre troubles, otherwise non-stops the whole of the time. The running of the car was greatly admired."

In view of the fact that it was suggested that some special favour had been shown to the De Dietrich in the awarding to it of the prize, it will be observed that all the points raised in the other competitors' letters were carefully reconsidered by the judges, and the award was made to the De Dietrich beyond all question on absolute merit and after having proved itself the most reliable car.

Yours faithfully,

February 2nd.

CHARLES JARROTT AND LETTS, LIMITED.

COMMERCIAL POINTS.

A Unique Exhibition of Mercedes Cars.—At the present time there is almost an unprecedented display, at any rate in this country, of different models of Mercedes cars at the show-rooms of Messrs. J. E. Hutton, Ltd., 81-83, Shaftesbury Avenue. Amongst the specimens on show are vehicles of 90, 70, 60, 40-45, 28-32, 24-28, and 18-28-h.p. cars. Those who are interested in this splendid type of car will find a visit to Messrs. Hutton's premises well repay them for their trouble.

LIKE many other firms, Messrs. R. and J. Pullman, Limited, were unable to secure space at the Olympia Exhibition for the display of the Pullman non-skid tyres. The difficulty, however, has been partially got over by the courtesy of the London and Parisian Motor Company, who have fitted a set of these special non-skid tyres to one of the exhibition Hotchkiss chassis, for which make of car this company are the sole concessionaires for Great Britain.

CAPTAIN GOFF, of the Automobile Volunteers and chairman of the Irish Automobile Club, having purchased a Clément car from Mr. E. H. Lancaster at the commencement of last season, has found it in every way so thoroughly satisfactory that he has recently arranged with Mr. Lancaster to supply him with another car of the same make.

THE Dunlop Tyre Company, we are informed, have received notification from Bombay that the award of the gold medal has been bestowed upon them for their covers, at the Bombay Exhibition. Of the twenty-one cars which actually finished the course in the Delhi-Bombay motor car trials, seven were fitted with Dunlop motor tyres. The Speedwell car, which won the Maharajah of Scindia's prize for the most economical car competing, was fitted with Dunlop motor tyres, as was also Mr. Vakil's Wolseley, winner of the consolation prize.

MESSRS. PIGGOTT BROS. AND CO., LIMITED, of Bishopsgate, are responsible for the effective general decorations at the Olympia Automobile Exhibition which opened this week on Friday.

THE Parsons Non-Skid Company have arranged with the United Motor Industries, Ltd., to make their Coventry house the Midland fitting depot for their non-skids. A stock of Parsons chains will always be held by the U.M.I. in Coventry for the convenience of manufacturers and private owners resident in the adjacent locality.

LAST year we gave in our Journal some particulars of the Parsons light delivery van, being manufactured by Messrs. Napier, of Southampton. We now learn that this business has been taken over by the Parsons Motor Company, Limited, of Town Quay, Southampton, where, in addition to the Parsons van, the company are also turning out specially designed motor boat engines. We understand that the ordinary carburettor is now used upon the engine instead of the fuel valve, and wood wheels are fitted in place of wire wheels. The premises also embody a garage with an accommodation for about 70 cars, and proper mooring is available for a reasonable number of motor boats.

MR. MACDONALD'S car, on which he won the world's five-mile motor car record in 3 mins. 17 secs., the world's mile record in 34½ secs., and the flying kilometre in 23 secs., was fitted with Dunlop motor tyres.

THE Hotchkiss cars are now seen in more general use in this country, and several well-known automobilists have already secured vehicles of this make. Amongst the latest to order a 17-24-h.p. chassis from the sole concessionaires for great Britain, the London and Parisian Motor Company, Limited, of 58, South Molton Street, W., is the Marquis of Linlithgow, K.G., &c., Secretary for Scotland. This chassis will be fitted with a brougham body.

MR. W. D. FAIR, who has for some time been associated with the Gobron-Brillié Agency in this country, has now given up this agency, and in future a new company, at 157, Knightsbridge, under the title of Cupelle Motors, Limited, will market a French car of that name, the management being the same as hitherto. A supply of spare parts of the Gobron-Brillié cars will, however, be kept in stock, so that customers can still apply to the new company for replacements. The new show-rooms of the Gobron Motor Company have just been opened in Bond Street.



A STRANGE APPARITION AT PICCADILLY CIRCUS.—At the end of last week, the Pedrail, with the many possible advantages of which we have dealt from time to time in the pages of the Journal, traversed London from Marylebone Station to Millbank Barracks, travelling via Portland Place, Regent Street, Waterloo Place and Whitehall, and stopping at the Local Government Board Offices in Charles Street. This journey was made in connection with the War Department Trials, the official placard of which department is seen in front of the machine. The solemn manner in which this mechanical vehicle threaded its way in and out of the traffic, with the grace of an elephant (without the swing), presented a remarkable sight to the large number of people who watched its progress through the streets of the Metropolis.

DOINGS OF PUBLIC COMPANIES.

Motor Traction Company, Limited.—In the Chancery Division, before Mr. Justice Buckley, Mr. Buckmaster, K.C., on January 27th, applied on behalf of the plaintiff in the case of *Mason v. the Motor Traction Company, Limited*, for an injunction against the defendant company, its directors, servants, and agents, restraining them until the hearing of the action or further order from carrying into effect an agreement, dated 9th December last, purported to have been entered into between the company and the defendant, Mr. Frank Grice Hackney, as trustee for an intended new company. The Motor Traction Company, Limited, was incorporated in June, 1898, under the title of the London Steam Omnibus Company, Limited, with a capital of £420,000, in £10 shares. In August, 1899, the name of the company was changed to the Motor Traction Company, Limited. Counsel argued that the memorandum of association did not empower the company to sell its undertaking for shares in another company, as it was proposed to do.

Mr. Astbury, K.C., for the company, and Mr. Disturnal for Mr. Hackney, submitted that the company had the right to sell.

On February 2nd his Lordship delivered judgment. His Lordship said the company had resolved to sell its undertaking for a certain number of partly-paid shares, and the sole question was whether the proposal to sell in this manner was *ultra vires*. The defendants were prepared to undertake not to carry out that part of the scheme relating to the manner of dealing with the purchase consideration without further resolution of the company. According to previous decisions a sale might be made for partly-paid shares. There was no reason, in the nature of things, why a company, whose objects included the taking over and holding of shares, should be precluded from taking shares partly paid. The defendants, therefore, having given the undertaking stated, there would be no order on the motion, except that the costs be costs of the action.

NEW COMPANIES REGISTERED.

Compensating Gearing Syndicate (Limited), 10 and 11, Jermyn Street, W.—Capital, £1,000 in £1 shares.

Jonas' Wheels (Limited).—Capital, £5,000 in £1 shares. Object, to carry on the business of manufacturers of and dealers in pneumatic and other tyres, wheels, and rims for cycles, motor cars, &c. First directors, G. Jonas, M. J. Jonas, B. Jonas, G. H. Bramson, and S. F. Edge.

R. L. Jepson (Limited), 18, Northgate, Blackburn.—Capital, £2,000 in £10 shares. Object, to acquire land and buildings in Blackburn or elsewhere, to manufacture and deal in motor and other cars, cycles, &c. First directors, R. L. Jepson and T. Cemm.

Langdon Davies Motor Company (Limited), 101, Southwark Street, S.E.—Capital, £5,000 in 4,195 shares of £1 each, and 16,100 shares of 1s. each. Object, to adopt an agreement with the Langdon Davies Motor Company, Limited, for the acquisition of certain patents and rights, &c. First directors, F. B. O. Hawes, A. W. Cree, F. W. Hartman, and E. Yatman.

London and Parisian Motor Company (Limited), 58, South Molton Street, W. Capital, £16,000 in £1 shares (8,000 preference). Object, to take over the business of agents for and dealers in motor cars carried on by Captain B. D. Corbet in London and elsewhere.

Société Anglaise des Automobiles (Limited), Broad Street Avenue, E.C.—Capital, £5,000 in 4,950 preference shares of £1 each and 900 ordinary and 100 deferred shares of 1s. each.

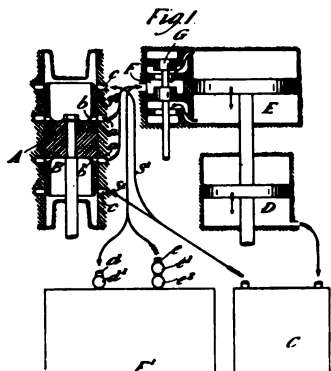
Stanley Electric Carriage Company (Limited), 19A, Carlyle Square, Chelsea.—Capital, £10,000 in £1 shares. Object, to carry on the business of vendors and factors of and dealers in motors, motor cars, airships, launches, &c. First directors, Major-General Euston H. Sartorius, V.C., C.B., A. E. Gadd, and G. Stephenson.



BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, 232, Strand, W.C.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

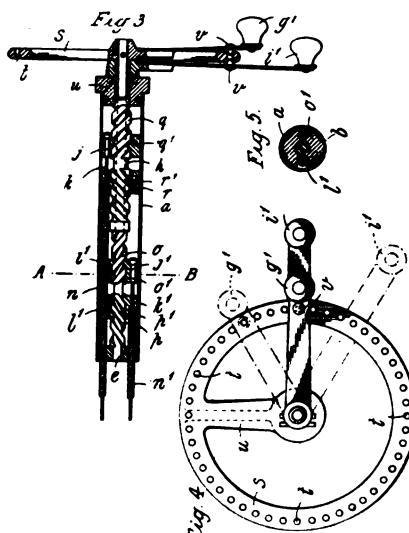
5326. 4th March, 1904. Improvements in Internal Combustion Engines. William Sison, Engineer, Gloucester. The object of this invention is to obtain greater efficiency in one-revolution or two-stroke cycle engines by compounding and by scavenging the products of combustion from the combustion cylinder by compressed air. There are two figures. Fig. 1 is a diagrammatic section of a double-acting engine.



The combustion cylinder, A, has exhaust ports, a a, which are placed in communication through ports, b b, in the piston, B, just before the air or charge inlet ports, c c, are uncovered by the piston at or near the end of the working stroke. The inlet ports, c c, are in connection as indicated by the arrows, S, with a compressed air reservoir, C, charged by an air compressing pump, D, worked in line with the low-pressure cylinder, E. The exhaust ports are in connection by means, S', with an intermediate receiver, subdivided into a working receiver, F, and a storage-chamber, F'. The receiver, F, is connected with the low-pressure cylinder, E, through the valve, G, which is so constructed that it allows of the admission of gases to the one side of the low-pressure piston while it exhausts the other side. The chamber, F', is connected to the working receiver through a passage, d, by the loaded inlet-valve, d', to the chamber, and gases pass when the pressure therein

falls to a certain amount below that of the working receiver. The outwardly opening valve, E', allows gases to pass back, i.e., from the chamber to the working receiver, when the difference in pressure is the other way. The valve, E', retains the pressure in the storage-chamber when the engine is stopped. — Feb. 1st, 1905.

6188. 12th March, 1904. Improvements in and relating to Steering and Controlling Devices for Automobiles and like Vehicles. R. M. A. Munro, 18bis, Rue de Marche, Neuilly-sur-Seine, France. The object of this invention is to arrange the steer-



ing and controlling apparatus of the car in a more convenient and compact manner by mounting them on the steering pillar. There are five figures. Fig. 3 is a sectional elevation. Fig. 4 is a plan. Fig. 5 is a section on the line, A, B. The hand-steering wheel, S, is fixed to the tube, a, of the steering

pillar. The tube, a, has a slot parallel with the axis extending nearly the length of the tube. Within the tube, a, are nuts, each with a lug, b, sliding in the slot to prevent its rotation. The nuts, d', d', d', d', have interior threads fitting the screw threads, d, d, d, d, respectively. The lower opposite threads are on the rod, E, the two upper opposite threads are cut on the sleeve, H. When the lever, G, is turned and the rod, E, rotated, the opposite threads, d, d, move the nuts, d', d', away from each other, the one exerting tension on the Bowden wire, K', by the nipple, J', and the other compression on the Bowden flexible tube, n', which is thereby converted into a pull on the wire equal to the travel of both nuts. The handle or lever, J, rotating the sleeve, H, with its opposite threads operates the wire, K, by its nipple, J, and the tube, n, of the Bowden wire, which pass through slots, J', in the lower nuts. The opposite threads give a much greater movement to the ends of the Bowden wires for operating the required or connected mechanism of the car. The arm, u, secures the wheel, S, to the tube, a. The wheel has a series of holes, z, in which the pins, V, on the levers, g', d', fit. The dotted lines, Fig. 4, show the other positions of the levers. — Feb. 1st, 1905.

Patent Specifications Published.

Applied for in 1903.

Published February 9th, 1905.

- 22,194. P. E. DOOLITTLE. Carburettor apparatus.
22,550. A. S. F. ROBINSON. Spring wheels.

Applied for in 1904.

Published January 26th, 1905.

- 3,104. J. TYLOR AND SONS, LIMITED. Engines.
3,650. — WILKES. Canopy hoods.
4,189. H. J. FURNEAUX. Speed indicators.
5,916. E. E. BRNTALL. Carburetors.
21,201. M. FISCHER. Motor cars.
21,900. P. DANNEELS AND P. EICH. Carburetors.
25,996. SOC. AUTOMOBILES ARIES. Steering mechanism.
26,265. A. SAMPSON. Ignition tube apparatus.

Published February 2nd, 1905.

- 1,806. J. S. HIGHFIELD. Internal combustion engine.
1,919. T. J. R. CLARKSON. Anti skid.
2,013. W. CHRISTIE. Motor vehicles.
5,147. E. TALBOT AND D. MONDEV. Electric switches.

The Automotor Journal, February 18th, 1905.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

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OLYMPIA EXHIBITION.—GENERAL VIEW OF THE HALL.

ABROAD.

PASSING EVENTS.

The Olympia Exhibition.

THE long-expected has been realised at last, and the greatest automobile exhibition which has ever been held in these islands duly opened its doors last Friday, an occasion which was sanctified by the customary lunch, followed by the usual speeches. Perhaps the most important feature connected with the opening of the Show was, if we may be allowed an Irishism, what took place before it was open. We refer, of course, to the unofficial visit of their Royal Highnesses, the Prince and Princess of Wales, who arrived at Olympia in the morning in time to make a thorough tour of inspection of all the principal exhibits before the public were allowed in. In this way the Royal visitors were enabled to satisfy the very pronounced interest which they both possess for the most recent automobile developments, more rapidly and more quickly than is possible to less favoured visitors. Never before has a Royal visit been so promptly paid to an automobile exhibition in this country, and that in itself is satisfactory evidence of the commanding position which the industry in this country has now attained. Moreover, in all probability an official visit will be made before the close of the Exhibition this year.

The example of H.R.H. the Prince of Wales was followed by the Prime Minister on Saturday when Mr. Balfour, accompanied by Lord Salisbury and Lord Lansdowne, made a tour of the Exhibition. Mr. Balfour, who, as everyone knows, is not only a motor car enthusiast, but a comprehending and discriminating enthusiast, expressed himself as delighted with the evidence of progress which he observed, while he displayed especial interest in the motor boat exhibits. Among other distinguished visitors who attended at Olympia were Prince and Princess Louis of Battenburg and their children. The Royal party took special interest in the Thornycroft stall, where the double phaeton built to the order of Princess Christian is on exhibition, and subjected this splendid vehicle to a very detailed inspection.

The Show itself is striking evidence of the enormous progress made. Not only do the general arrangements of the hall itself, and the artistic manner in which the stalls and exhibits are arranged, form a triumph in Exhibition organisation, and a complete vindication of the selection of the Olympia building for the purpose, but the exhibits themselves provide the most convincing proof of the splendid growth of the British industry, and the enormous progress that has been made both in general design and also in workmanship and finish.

While the position of the British industry is thus proved by the Exhibition to be promising in the extreme, the demand for motor vehicles of all kinds and descriptions is equally shown to be rapidly increasing, by the large number of foreign cars displayed by their English agents. This is one of the most characteristic features of the automobile industry. The more manufactures increase, the more imports increase, the more the demand increases, for every automobile that goes into work produces a demand for others, and as far as can be judged it will be many a year yet before supply even approaches demand.

The Opening Day.

THE opening of the Exhibition was a great day for automobilism, perhaps one of the greatest days it has ever

had. For the most representative members of the Society of Automobile Manufacturers and Traders, the most distinguished individual representatives of the automobile movement, members of Parliament interested in automobilism, and Ministers who appreciate the importance of the movement, both in developing the industrial resources of the country and of the departments over which they preside, were present to do honour to the occasion, and say a good, and occasionally a humorous, word in favour of the new locomotion. The principal speaker was the Postmaster-General, Lord Stanley. Lord Stanley is invariably a brilliant and amusing speaker, and he was as entertaining this year at Olympia as last year at the Crystal Palace. There is something specially attractive in finding the bearer of one of the oldest titles, one of the names which is most heroically associated with English history, a spokesman of the greatest movement which the present generation has seen. The old war cry of the Stanleys before they were Earls of Derby was suggestive of progress. There is no family whose representative is more entitled to speak on behalf of advancement and economic development than that of Lord Stanley, and it is therefore particularly appropriate that under his rule as Postmaster-General the automobile should have been adapted on a constantly increasing scale for the postal service of the country. For some time past there has been a contract for running the mails by road between London and Brighton, horses being the motive power. This Lord Stanley very appropriately announced is shortly to be superseded by automobiles. It will be no surprise to those interested in the movement, though it seems to have been somewhat of a surprise to the general public, to learn that the new service would carry 50 per cent. more parcels and other matter, and by the increased speed at which it would travel would provide facilities for posting later to Brighton, and in Brighton for London, than was possible before, or would be at present possible by train service, and finally that the new service would save the ratepayers a considerable amount of expense. Lord Stanley further pointed out that one of the great advantages of an automobile road service was that if one of the vehicles were to break down there is little difficulty in transferring the mails which it carried to another vehicle, and so enabling the consignment to arrive at its destination with very little delay, a state of things impossible, it need hardly be pointed out, on any rail service.

The Attitude of the Police.

LORD STANLEY showed, as usual, that he is possessed of a vein of subtle humour when, in speaking of the Act of 1903, he referred to it as the "sentence" passed upon automobilists by the Legislature. If he had gone on to describe it as a sentence of "three years hard" it would perhaps scarcely have been an exaggeration; but he pointed out that it would come up for revision in another year. So far his remarks were quite above criticism, but at this point he proceeded to tread upon ground which was more open to objection. We, and other automobile journals, have frequently felt compelled to object to the methods employed by the police for obtaining convictions against automobilists, and to complain of the procedure frequently adopted. In this respect Lord Stanley seemed to think that everything was as it should be. He is an automobilist himself, but we do not doubt that as a Minister of the Crown the police have

probably in his case tempered the zeal which they display to the ordinary mortal, with the discretion which they invariably adopt to those highly placed in the service of their country. We wish we could believe that only "those drivers who *flagrantly* broke the law were taken to task." "It is not good to laugh at the police when they are doing their duty," said Lord Stanley. "It was our duty to help and not to check them in what was often an unpleasant task." Well, we cannot say that we have seen any evidence of the police finding it unpleasant, but what we and other papers have objected to is not the performance of their duty on the part of the police but the exceeding of it. The automobile Press has practically without exception denounced the reckless driver, and has branded him as the greatest enemy of the automobile movement. But at the same time, inspired by elementary feelings of justice, it has found itself compelled to criticise the style of evidence provided in innumerable motor car prosecutions by the police. Lord Stanley was surprised that his allusion to "chronographs" was greeted with hilarity. Surely the fact that when the police time motor cars by means of "chronographs," the times said to be registered invariably work out so as to afford the least possible amount of calculation, is suspicious, to say the least of it. And Lord Stanley seems to have entirely forgotten where the police arrange "to do their duty" on any particular stretch of road, and some public-spirited automobilist goes back and informs others that the police are thus engaged, such a warning has frequently been made the subject of a summons. Where the public is endangered, where injury is done, where obvious recklessness is manifested, every public-spirited automobilist will support the police in endeavouring to punish the reckless driver who was the cause of such trouble. But we and most other organs of the automobile Press have invariably insisted that to lay traps for car drivers on open stretches of road, where no one is endangered, and where the existing law "were honoured rather in the breach than in the observance," is an underhand and un-English method of procedure which, even if legally justifiable, is better passed over in silence, and not made the occasion of public encomium.

A Question of Politics.

It seems scarcely believable, but it is nevertheless a melancholy fact, that a decided attempt is being made by the "baser sort" of the Radical Press to oppose the advent of the motor 'bus. The motor 'bus is held up to ridicule and even obloquy as the darling of the "yellow Press," by which is apparently to be understood the *Daily Mail*, which has consistently and persistently, as our readers are aware, done all in its power to promote the welfare of the automobile movement, and in particular has been most active in promoting the introduction of the motor-driven omnibus. Whether under the sobriquet "yellow Press" there is also a gentle slash at our humble selves must remain uncertain. The fatuity of the situation is ludicrous beyond words. Nothing surely can be more democratic than a penny 'bus, and surely nothing can be more progressive than the substitution of motor power for horse-traction for the benefit of the multitude. The same section of the Press is enthusiastic in its support of the electric tram, which is lauded to the skies as the poor man's motor car and all the rest of it. What is the explanation of the extraordinary inconsistency? It is, we believe, that the London County Council's money, or rather that of

London's ratepayers, is sunk in the electric tram system. The majority of the County Council are Radicals, or at any rate Liberals, and if the profits of the electric tram are seriously interfered with by the motor 'bus, the County Council will look very foolish, and their popularity with the electorate will be enormously reduced. But this is a funny principle on which to judge of the merits of great industrial and economic movements.

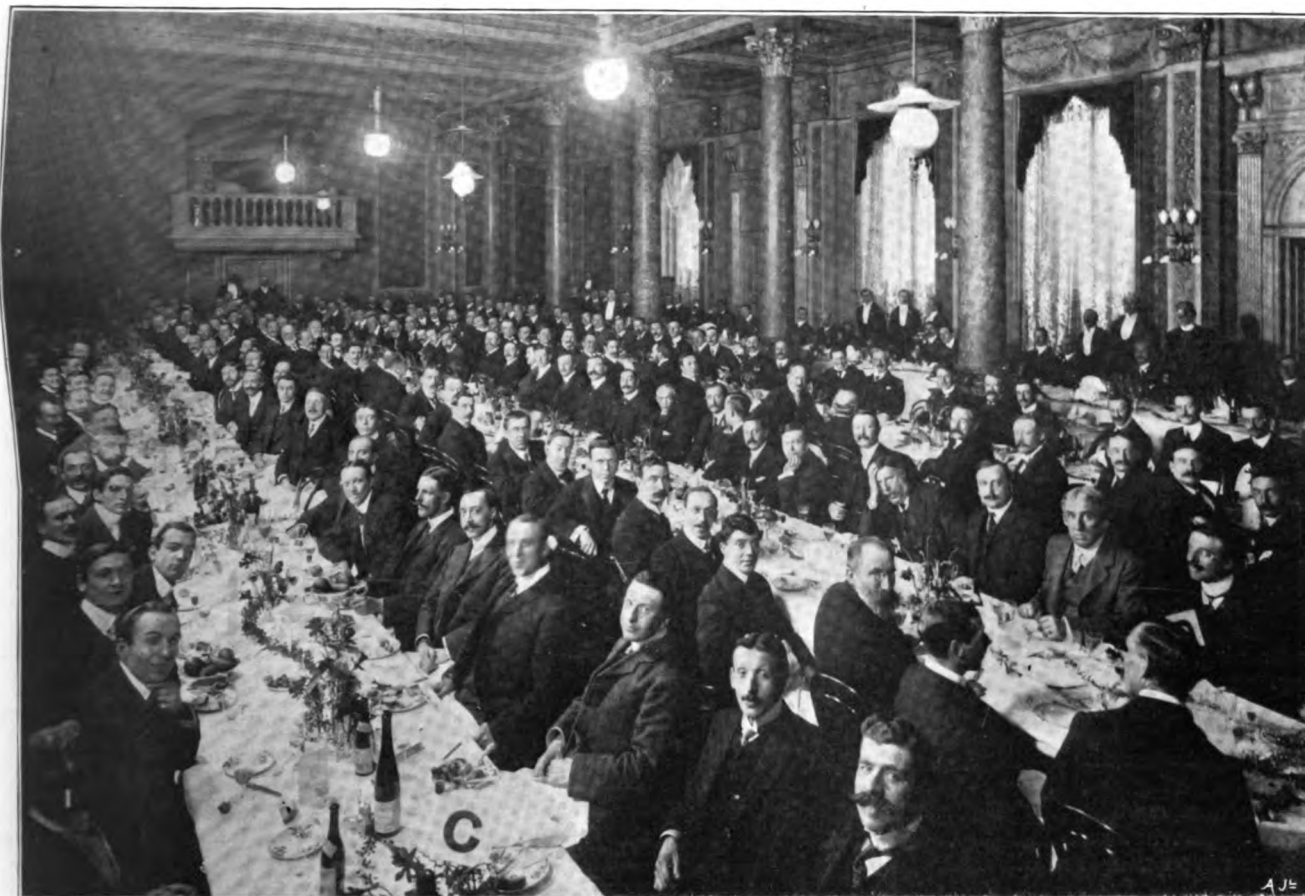
It will come, therefore, as something of a painful shock to these gentlemen to learn that the motor 'buses recently introduced into Birmingham are giving the greatest satisfaction, and that it is clear that that town may shortly be added to the list of places, like Eastbourne and Hastings, where the motor 'bus is proving itself thoroughly reliable and satisfactory, and in every way superior to the electric tram, which it is probably destined generally to replace.

"Faugh-à-ballagh."

Who would not be a District Councillor, particularly a District Councillor of Finchley? It is hardly possible to imagine anything so conducive to a sense of self-esteem as to be one of the Councillors of this august body. For it is they who have ordained that the North Road, near Finchley, shall have a large part of its surface blocked up and a great part of the sky which hangs over it obscured by the erection of those central pillars for carrying the trolley wires for the electric trams, which have made everybody who has seen them employ language usually too forcible for ears polite. And the Finchley District Councillors have done this in spite of the Roads Improvement Association, in spite of the Middlesex County Council, who strongly objected to the erections, and in spite of the Local Government Board, who sought in vain to dissuade the District Council from their vandalism. It is a wonderful country, a wonderful system of laws, which enables local quidnuncs of this calibre not only to obstruct traffic but to oppose a County Council and a Government Department as well.

It is time to make an end of such nonsense. "Faugh-à-ballagh"—clear the road—and make a clean sweep, not merely of these obstructions, but of the powers which enable these corporate Gothamites to stop progress and prevent the sensible organisation and management of our roads. The Roads Improvement Association are introducing a Bill during the forthcoming Session into Parliament. The object of the Bill is to carry out the recommendations of the Departmental Committee on Highways, and one of these recommendations is that our national roads shall be classified, and the principal through-roads, at any rate, put under the management of a central authority. When such a measure becomes law, we shall have no more of the Finchley central pole obstruction, nor shall we see so preposterous a method of opposing progress permitted to continue as that on which we commented some time back, by means of which the local District Councils in Cornwall have succeeded in stopping the Great Western Railway's road service of motor 'buses. These local "Schildbürgers," it will be remembered, refused to roll the rough metal which they were compelled by statute to put upon the roads, and so the railway company were compelled to take off the service of 'buses which was benefitting the neighbourhood in an immeasurable degree. The creation of a central authority for managing our roads as the Roads Improvement Association's Bill proposes should render such an abuse of local power impossible.

THE OLYMPIA EXHIBITION OF 1905.



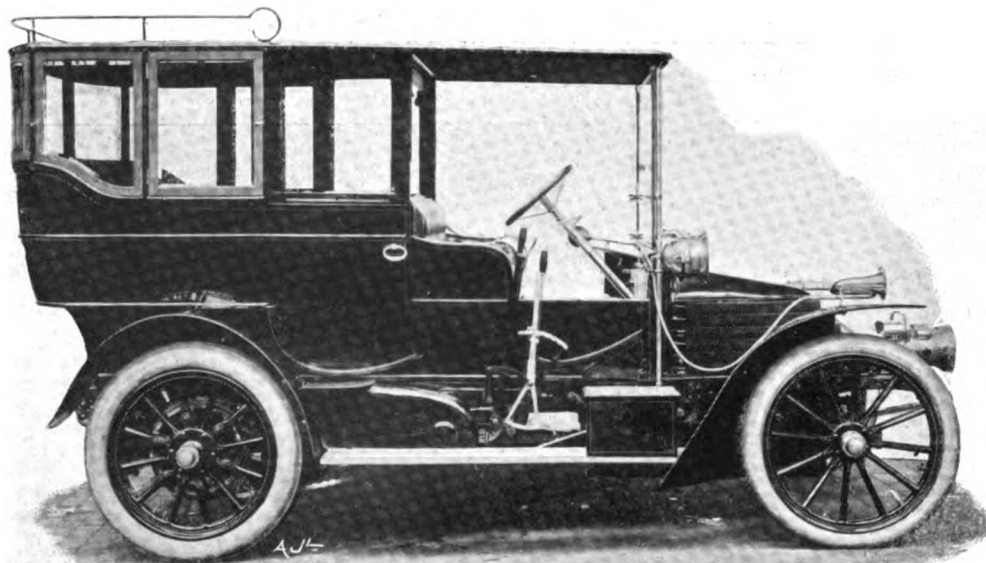
OLYMPIA EXHIBITION.—The Inaugural Lunch at Olympia, when Mr. Sidney Straker, the President of the Society of Motor Manufacturers and Traders, occupied the chair, and the principal guest of the day was Lord Stanley.

So unqualified a success has the Exhibition proved to be—at any rate so far—that even the most sanguine hopes of those deeply interested in the British automobile industry have to a very great extent been realised. Olympia has proved to be a great improvement in many ways over the Crystal Palace, for it is certainly not only more accessible, but enables the various stands to be visited with considerably less personal fatigue. The visitors up to now have, moreover, been by no means a mere sight-seeing crowd, although the attendance has been excellent. But, perhaps most noticeable of all, the exhibits have, as a whole, an amount of interest which has certainly never been equalled on any previous occasion of this kind. Apparently, therefore, the only cause there can be for the slightest shade of disappointment lies in the fact that, even in Olympia, London does not possess a sufficiently spacious and imposing building to do thorough justice to this extremely important branch of engineering. The Exhibition is, this year, so packed full of good things, and it is so extremely well calculated to appeal to all and every class of buyer, that, in these respects at any rate, it seems bound to stand out as *the* Show of this season. It is, moreover, far from disparaging to our Continental neighbours to say this, since so many of the best makers represented at Foreign exhibitions have sent over the same

machines to Olympia, where they now stand side by side with the extremely fine cars produced by our own manufacturers which now compare so very favourably with them.

Of so varied a nature are the exhibits, and so numerous are the improvements which have been made in various directions during the past year, that, although we do not need to again deal fully with those cars that were on view at the Paris Salon, and although we have been able—in our descriptive articles—to keep our readers well informed concerning the recent doings of most English firms, yet it is obviously an impossible task to give, in a single issue, anything like a complete and comprehensive report of the further features of interest that are now in evidence at Olympia. In order to enable us to deal more adequately with the exhibits as a whole, we purpose directing our attention to each class of machine in turn, including the motor boats. We, nevertheless, in this issue, are able to add considerably to the long list of special illustrated articles, which have already been given by us concerning most of the new models, and we also give some particulars of the tyre exhibits, which occupy a considerable amount of space in the gallery.

Even in the following classified report of the show, it will only be possible to mention the chief characteristics of the individual exhibits but we hope, in the



AT OLYMPIA.—A handsome 20-h.p. Wolseley Car that has been built for Mr. R. A. Hadfield, of Sheffield.

ordinary course, to be able before long to deal separately, and at greater length, with those that are especially interesting, or have new features of more than ordinary importance.

Steam Lurries.

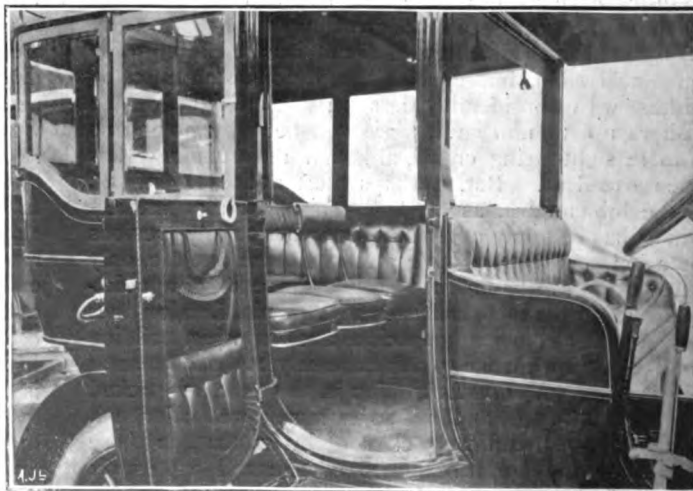
As might almost be expected, in view of the very high degree of perfection that has for some time been reached by the many well-known English makers, there is less sign of structural alteration or improvement in this heaviest type of self-propelled vehicle than in any other. Even the new Local Government Board Regulations, controlling their use on the highways, have not as yet had time to make their effect apparent to any considerable extent, although it is to be supposed that they will ultimately have some effect in this direction. The nearest approach perhaps is to be found in one of the new Straker models, for it differs to a great extent from previous practice. It is intended to carry a 4-ton load, and has the engine mounted on the top of its locomotive type boiler. The same tendency to substitute a locomotive boiler for one of the water-tube type is also met with on the latest 6-ton Thornycroft wagon, the chief reason doubtless being the saving in cost that is effected.

Other builders of heavy steam wagons include the Coulthard Company, the Bristol Wagon Company, Messrs. Hindley and Son, Jesse Ellis and Co., and the constructors of the Hercules wagon, while Messrs. Wallis and Stevens, whose tractors are already well known, are also well represented. The Hindley $2\frac{1}{2}$ -ton lurry was only recently illustrated in our columns, and the leading features of the others have previously been dealt with by us.

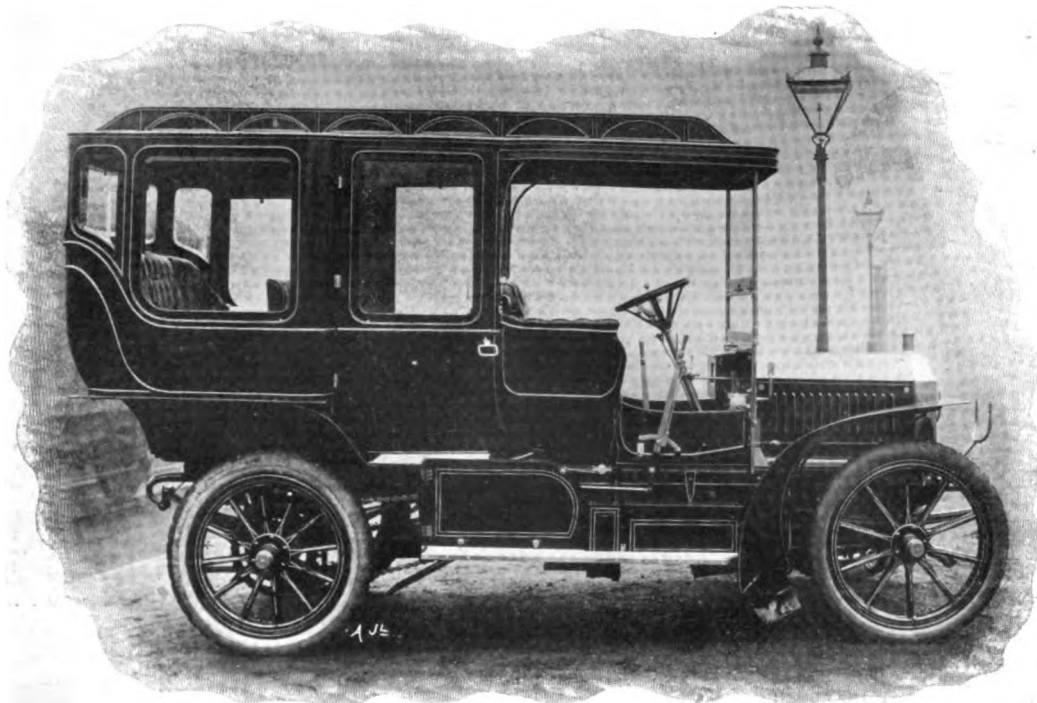
Petrol Lurries for Heavy Loads.

Although it is comparatively recently that there has been any very great demands for petrol vehicles capable of carrying loads of from 2 to 5 tons or more, yet an enormous amount of progress has been made of recent years—particularly in Germany—and, during the past year

or so, a large number of English firms have taken up this branch of the industry. So remarkable, however, has been the increased use of motor 'buses just lately, that the energies of these manufacturers have been chiefly concentrated upon their production, and several of them have preferred—at Olympia—to employ the space at their disposal for exhibiting 'buses, rather than lurries. The latter type has, therefore, suffered somewhat on this occasion in consequence. Several of those firms, however, to whom we shall refer when dealing with the former class of vehicle, are also in a position to supply lurries capable of dealing with very heavy loads. At the Show, the Wolseley Company have one of their 20-h.p. 2-ton lurries, which has a slow-running twin-cylinder horizontal engine, and a transmission mechanism of much the same character as that adopted on their pleasure cars. There is also a new 4-ton Simms-



AT OLYMPIA.—View of the interior of Mr. R. A. Hadfield's 20-h.p. Wolseley Car.



AT OLYMPIA.—The 24-h.p. Napier Car fitted with a Mulliner body, the roof of which has a clerestory to improve the ventilation and lighting.

Coulthard wagon, that is of the chain-driven type, and is provided with a "Soames" gear giving three speeds and a reverse. The Milnes-Daimler Company exhibit one of their well-known 5-ton vehicles, equipped for using ordinary paraffin oil, the Motor Car Emporium show a 5-ton "Durkopp," and the Beaufort Company have on view the same lorry as at the Birmingham exhibition.

Motor 'Buses.

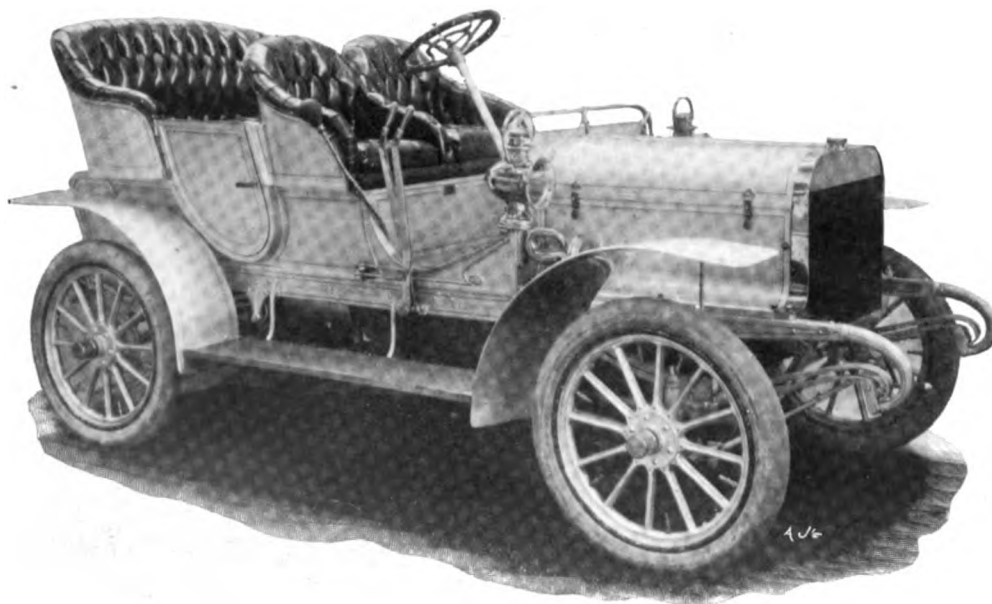
Apart from the numerous petrol 'buses, which include



AT OLYMPIA.—Interior of the 24-h.p. Napier Car, which has two swinging and folding seats inside, in addition to the large seat at the back that holds three people.

those of the Wolseley, Thornycroft, Maudslay, Milnes-Daimler, Straker-Squire, Brush and Durkopp types—and the Dennis and the Ryde chassis for similar vehicles—the new Clarkson double-deck steam 'buses are prominent features at Olympia. In these latest machines, several important alterations have been made. For not only is the engine duplicated, so that it now has four horizontal cylinders instead of two, but a "flash" generator has been substituted for the fire-tube boiler, a down flue conducts the burnt gases away beneath the body, a fan draws the air through the condenser, and the steam system generally has been modified to suit the other altered conditions. Without saying more at the moment, it may be of advantage to mention that the feed-water is automatically controlled by the steam pressure, that the fuel-valve is interconnected, in an ingenious manner, with the throttle-valve, and that an electric pyrometer enables the driver to ascertain the temperature of the steam in the generator, in just the same way that the ordinary gauge indicates the steam pressure.

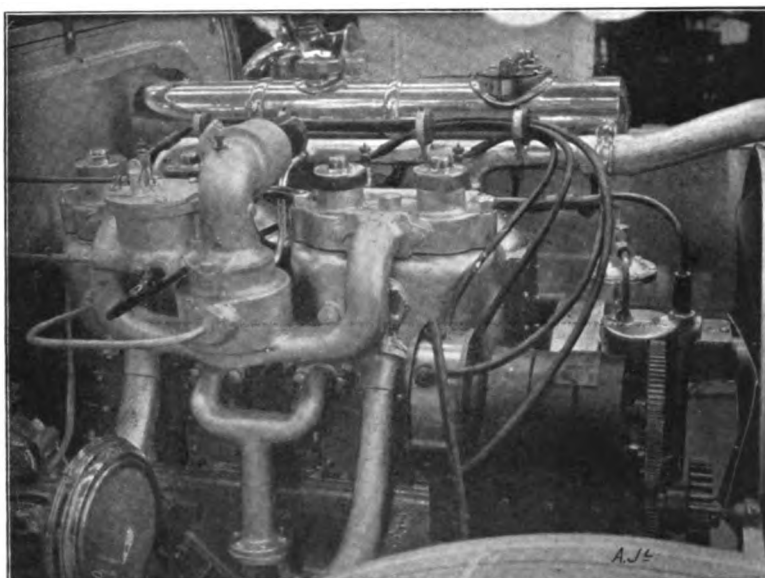
The Wolseley petrol 'bus is constructed in the same manner as their 2-ton lorry, to which we have already referred; the chief feature of the chassis is the simplicity of the driving mechanism, and one of the most noticeable characteristics is the introduction of helical springs between the radius rods and the back axle. We understand that twenty-five of these 'buses have been ordered by the London Motor Omnibus Company. The Thornycroft Company have also on order a similar number of the 24-h.p. double-decked 'buses that are made by them. This type of vehicle has a side-chain type of transmission, and the driving-wheels are fitted with this firm's well-known spring-drive device, which has proved so satisfactory on their steam cars. Of the Milnes-



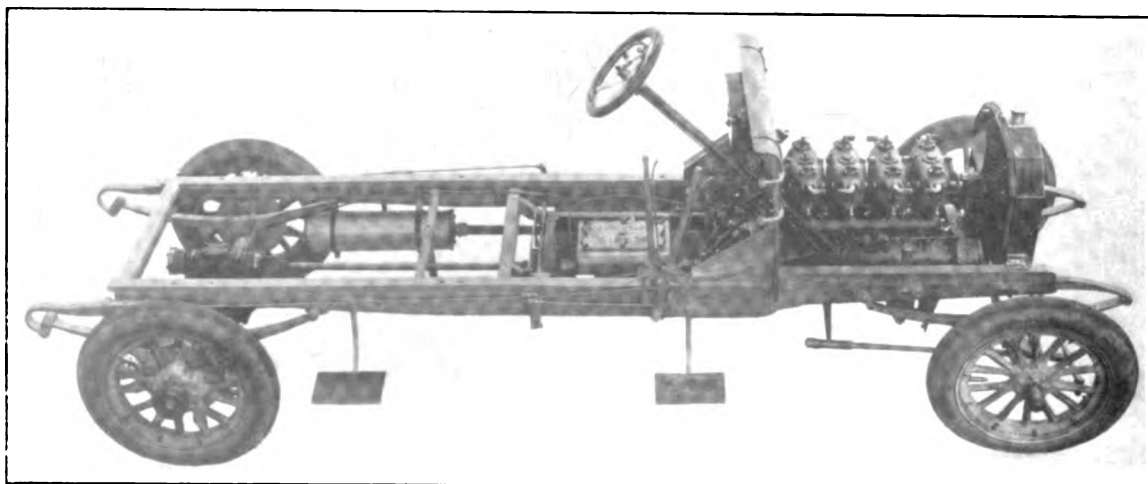
AT OLYMPIA.—The new 16-20-h.p. Winton Car, which has a 4-cylinder vertical engine beneath the bonnet in front, and a propeller-shaft drive to the live-rear-axle.

Daimler and the Straker-Squire 'buses no constructional details need be given here, for both these systems have already been fully dealt with by us in separate articles. Attention, however, might be drawn to two slight modifications that we noticed on the Milnes-Daimler 'buses that are on view, for, apart from the very greatly improved appearance that has been obtained with the latest design of bodies, the change-speed-lever—which is now of similar construction to that on a Mercedes touring car—is placed at the side; the other modification is that the wheels are constructed to enable a new tyre *and* rim to be substituted as a complete unit, without sending the wheel away.

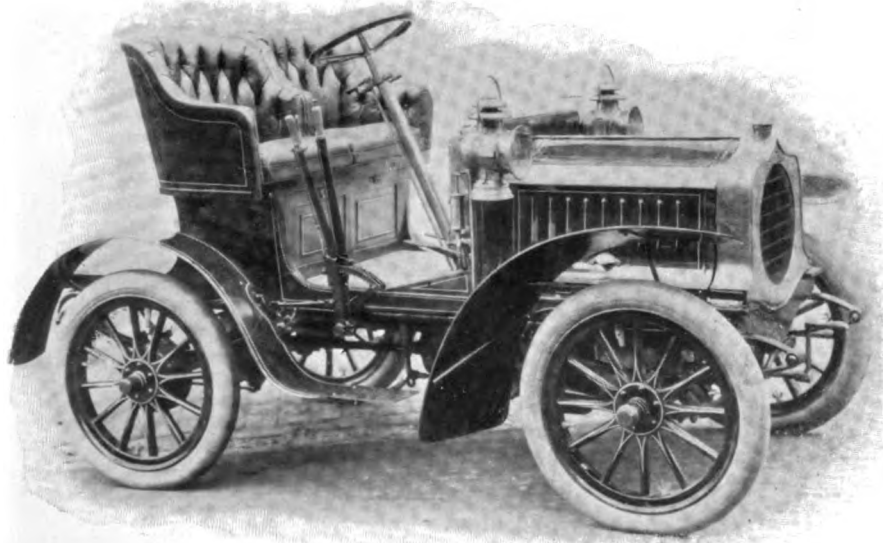
The 30-h.p. Brush omnibus, of which a partly-finished chassis is shown—in addition to a complete 'bus designed on tramcar lines for special work on long-distance country routes—is chiefly noticeable in consequence of the peculiar type of change-speed-gear with which it is fitted. This gear has the spur-wheels, that give the



AT OLYMPIA.—Side view of the 4-cylinder vertical Engine in place on the 16-20-h.p. Winton Car.



AT OLYMPIA.—The 18-22-h.p. Dennis Chassis, which is fitted with an Aster Engine, has laminated spring-horns for the side springs, and has its live-rear-axle driven by worm-gearing.



The 6-h.p. Speedwell.—Several improvements have been introduced into this new model which has, even in external appearance, been considerably altered. The engine has mechanically operated inlet-valves, an "automatic" carburettor and gear-driven commutator, while the body is considerably more roomy, the chassis longer, and the wheels larger than formerly.

forward speeds, in mesh at all times, and each speed has an individual friction clutch, of an internal expanding type, for bringing the required "speed" into play. It has a side-chain drive.

Among the delivery vans driven by petrol engines, there are quite a large number on view which have practically the same chassis as used by the makers for their touring cars, and they vary very considerably, too, in size, power and capacity. Apart from them, and apart from those vans, which are in reality luries fitted with closed bodies for goods—such as that built by the Wolseley Company for the Great Western Railway -- the Thornycroft, the Ryknield, and the Mo-Car Companies are amongst those who have produced distinct types. The Thornycroft van has a 4-cylinder 20-h.p. engine and a live axle driven by a single chain, while another interesting exhibit of theirs is a smaller van, in which is fixed a vacuum-cleaning plant, with its own separate petrol engine to drive the pump. The Ryknield chassis practically employs the same transmission gear as that used on their twin-cylinder touring car, but the live rear axle

of that vehicle is made to constitute a differential countershaft instead, being carried in such a way that spur wheels mounted on its extreme ends mesh with corresponding spur wheels on the hubs of the road wheels. This countershaft is supported on a triangular framework, which is rigid with the back axle, and is attached centrally to the frame by a universal joint in front, no other radius rods of any kind being used.

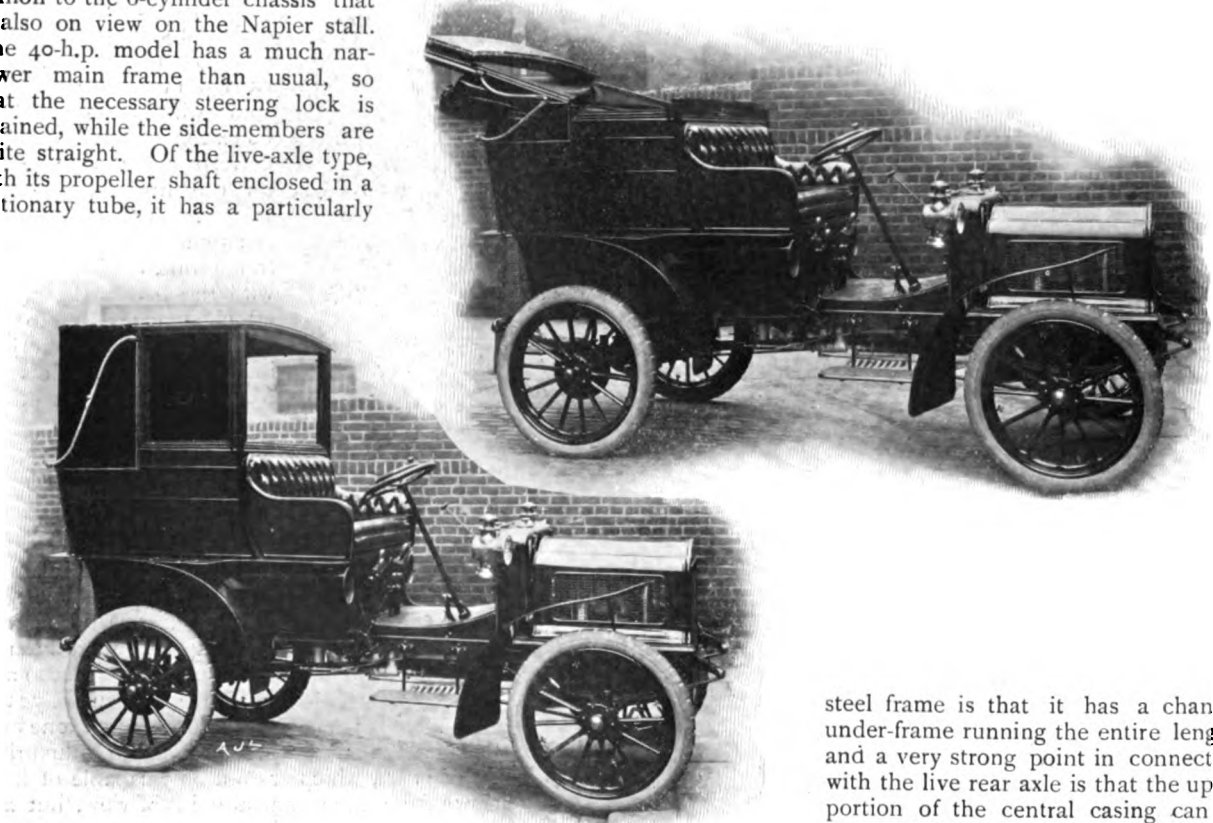
The Touring Cars.

British manufacturers are this year making an extremely imposing display of the very highest class of high-powered vehicles, to suit the most fastidious and exacting of wealthy purchasers. They are also able to prove conclusively that they are now not one whit behind their foreign rivals in the production of luxurious and handsome cars, which are not only capable of holding their own from a mechanical point of view, but also in the matter of appearance and of comfort. The new 40-h.p. Napier chassis is, perhaps, as well calculated to impress the visitor as any other, for it is a remarkably fine example of high-class workmanship



AT OLYMPIA.—The long wheel-base Hutton Light Car, fitted with 4-seated body having a Cape cart hood. This British-built vehicle, which has a 4-cylinder engine, has been put on the market at a very low price.

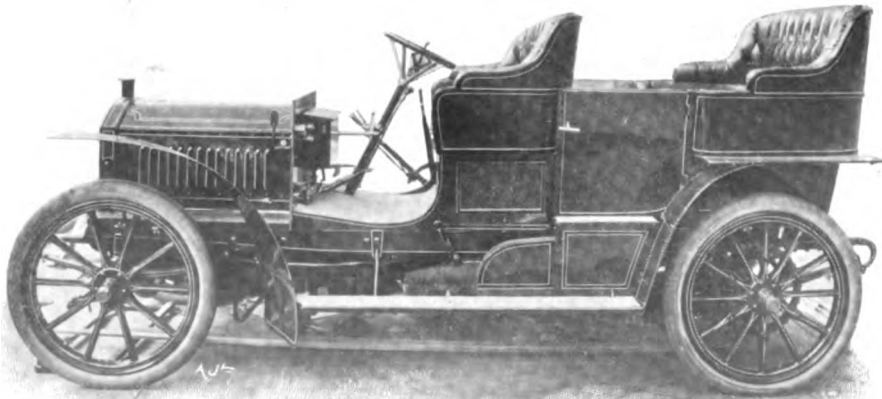
and design, and forms a fitting companion to the 6-cylinder chassis that is also on view on the Napier stall. The 40-h.p. model has a much narrower main frame than usual, so that the necessary steering lock is retained, while the side-members are quite straight. Of the live-axle type, with its propeller shaft enclosed in a stationary tube, it has a particularly



AT OLYMPIA.—Two views of the new 15-h.p. White Landauette, showing it both in fine-weather and wet-weather trim. The entrance is at the rear, and the hood swings sufficiently far back to avoid being in the way. This handsome vehicle, which has seating capacity at the back for three, or even four, people, is elaborately finished, and is extremely well-upholstered.

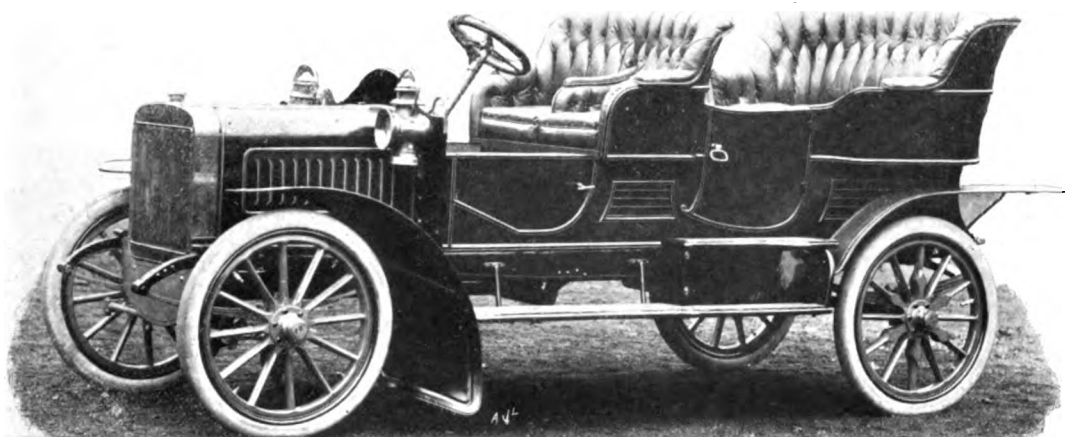
clean and simple appearance, for, in spite of its being an extremely powerful car, it is far from giving that idea of clumsiness which was at one time associated with such vehicles. The engine is almost pretty, with its mechanical inlet-valves above its exhaust-valves, and with the aluminium jacket-casting into which the cylinder liners are forced. The new Ariel chassis is another striking British exhibit. It is shown with a 4-cylinder engine, but has been designed so that its 6-cylinder counterpart can be fitted instead. An unusual feature of the pressed

steel frame is that it has a channel under-frame running the entire length, and a very strong point in connection with the live rear axle is that the upper portion of the central casing can be removed and that bevel wheels of different sizes can be introduced to change the gear-ratio, as required. The springs employed, which are extremely long, are of that type in which two additional leaves are arranged above the longest leaf to give the same restraining effect as that aimed at with the various "shock - damping" devices now on the market. The engine has one cylinder casting, but separate heads for each cylinder, and the mechanically operated inlet-valves are neatly fitted above the exhaust-valves, so as to be operated by the same cam-shaft, and to reduce the surface area of the combustion-chamber. In the matter of this arrangement of the valves, the engine conforms with what has this year evidently become the most approved practice, but the



AT OLYMPIA.—The 18-h.p. 4-cylinder "Popular" Napier Car, fitted with side entrance tonneau body.

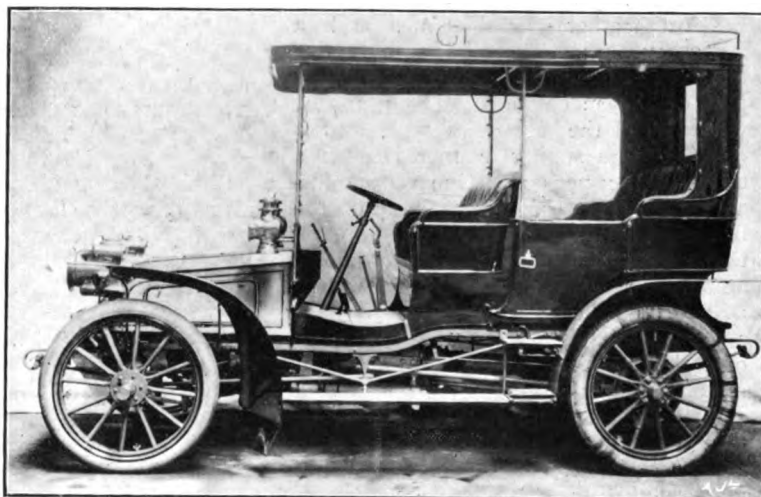
Ariel Company have gone a stage further, for all the valve-stems are inclined, and thus to a certain extent follow the lines of the Daimler Company. Other special characteristics of this car are, that it has a high-tension magneto system of ignition, in addition to the ordinary high-tension system, that a metal to metal clutch of the internal cone type is employed, that there is a true, double-universal joint between the clutch and the gear-box, and that ball bearings are provided throughout the entire transmission mechanism, as well as for the road wheels.



AT OLYMPIA.—The 24-h.p. Ryknield Car, which is one of the new all-British vehicles that is referred to in our Show report this week.

Of the other British cars that come under the same category, the 1905 models of the Daimler Company, the Thornycroft Company, the Crossley Company, and the Maudslay Company have already been, or are now being, separately dealt with in detail in our columns, so that it is not necessary to more than refer to them in this report, and to say that they are, one and all, well represented at Olympia. The new Brotherhood vehicle, too, is at present receiving very full treatment at our hands, and it is, perhaps, not too much to say that it is attracting even more attention at the Show than any other individual vehicle.

A very excellent car, which is quite new, and is of British manufacture throughout, is the 20-25-h.p. vehicle of Messrs Legros and Knowles, whose works are at Willesden. The chassis, which has a pressed steel frame, is of the chain-driven type, and the engine, which has its cylinders cast in pairs, has a

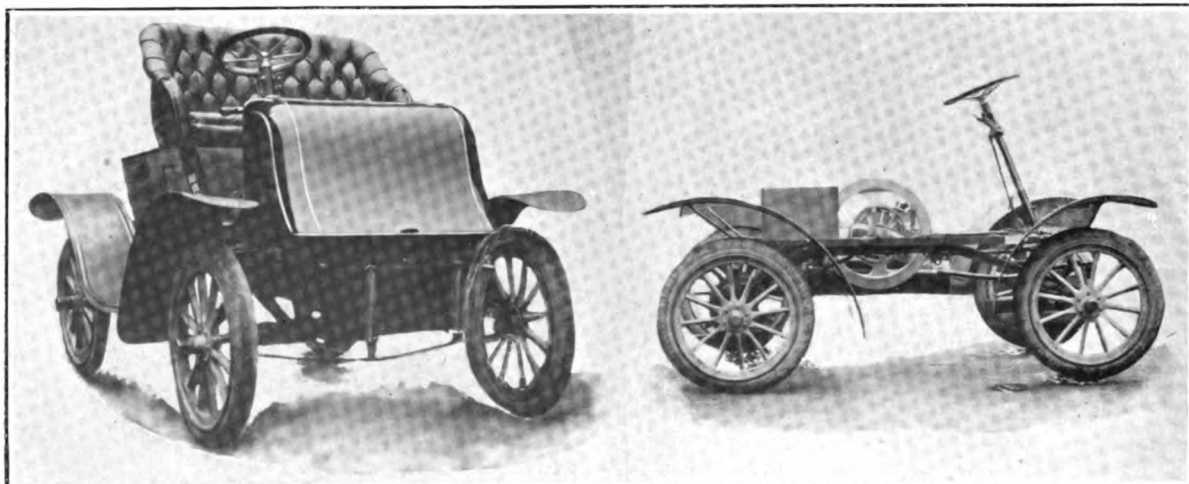


AT OLYMPIA.—One of the latest Wilson-Pilcher Petrol Cars, built and exhibited by Sir W. G. Armstrong, Whitworth and Co.



AT OLYMPIA.—The new 8-h.p. Singer Petrol Car, which has a 2-cylinder horizontal engine, arranged in conjunction with a novel type of change-speed-gear, beneath the body, and independent chains each side, for giving a direct drive on the 2nd and the 3rd-speeds, respectively.

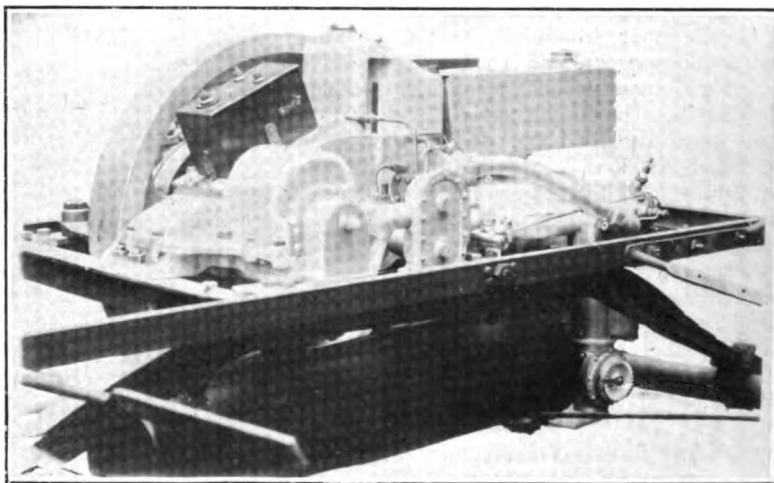
normal speed of 750 revs. per min. The mechanical inlet-valves are fitted centrally in the cylinder heads, and the engine is controlled by varying their lift, this being done by an eccentric rock-shaft that carries the pivoted operating levers, which are—in turn—actuated by vertical push-rods from the same cam-shaft as the exhaust-valves. Low-tension igniters are arranged on the opposite side, and these are automatically “timed” by a centrifugal governor, while—as a stand-by—high-tension plugs and a hand-timed commutator are provided. Great accessibility of all parts has been chiefly aimed at throughout, with very great success, but of the actual details of the construction, we are unable to say more



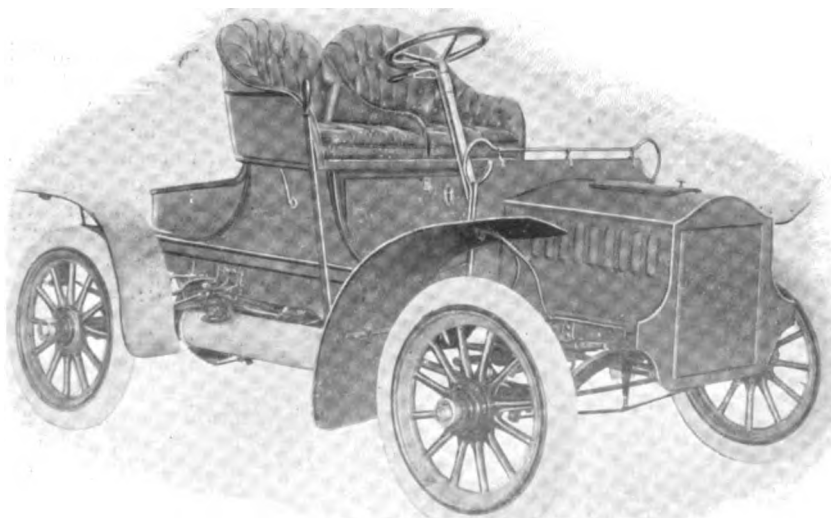
AT OLYMPIA.—The Adams-Hewitt Petrol Car. Views showing the complete vehicle, and also the Chassis without its body. It has a single cylinder horizontal engine, giving 9-h.p. at 900 revs. per min., and a single chain-drive from the change-speed-gear on the crank-shaft.

at present. The main clutch, which has a leather-faced cone, and a stationary spring, can be entirely dismantled without interfering with any other part of the mechanism. The gear-box, which is of the Mercedes type, and is operated in a similar manner, is given a three-point suspension. One very noticeable feature is the construction of the brakes, which have steel and cast-iron friction surfaces, can be quickly adjusted, and are very effective.

As usual, the Wolseley Company have a very complete show of pleasure vehicles of all kinds, as well as of those for commercial purposes, and they are making a special feature of the new 8-h.p. model that constitutes one of the cheapest, and, at the same time, most capable, of popular four-seated cars. The Siddeley exhibit, including as it does the actual 12-h.p. 5,000 Mile Trial car—with many of the



AT OLYMPIA.—View of the Engine on the Adams-Hewitt Chassis, showing the low-tension Magneto, the Coil for the high-tension System, the Lubricating Tank, the Oil Pump, and the water-circulating Pump.

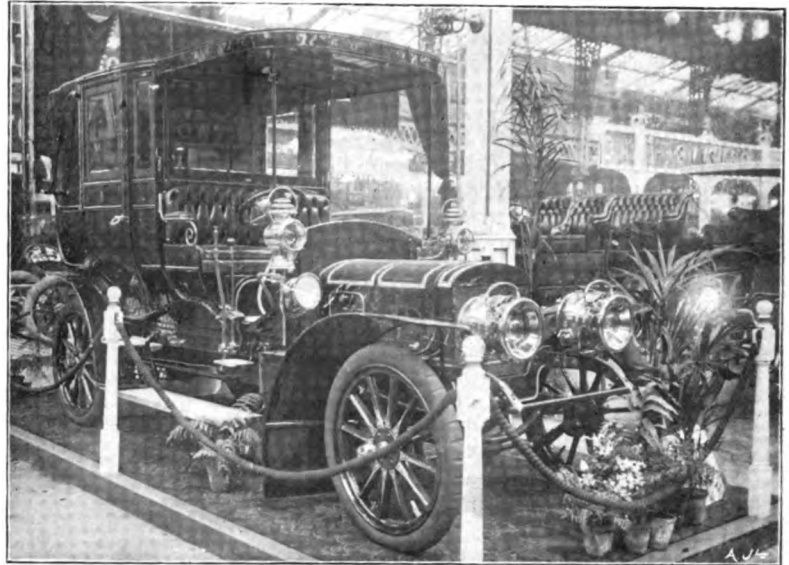


AT OLYMPIA.—One of the latest Cadillac Petrol Cars, which has a new type of body, with the radiator forming the front of the bonnet.

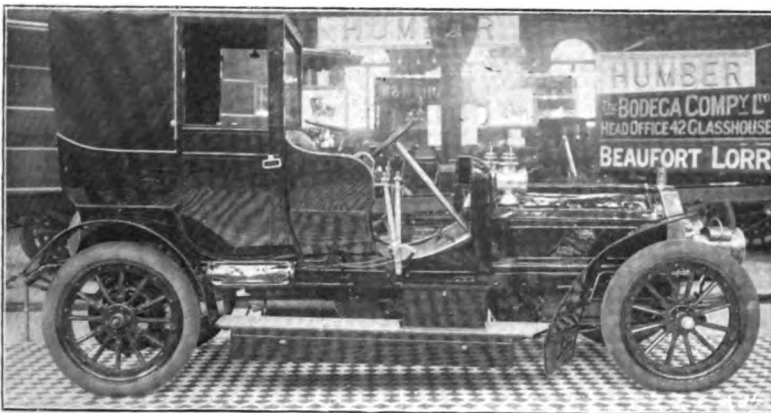
parts detached to show their present condition—is excellent, but, since it has been unnecessary to make any radical alterations in the 12 or the 18-h.p. models, the little 6-h.p. single-cylinder vehicle that we described last week is the only real novelty.

Amongst the other, numerous, comparatively large cars of British manufacture, the 12-h.p. Marston "Sunbeam," with its enclosed side-chains, the 4-cylinder Dennis, with its spring-drive, worm-driven live-axle, laminated spring-horns for all four springs, and the Belsize models that we described recently, are deserving of special mention, while of those that have radically distinct systems of

driving mechanism are the Singer, Lea and Francis, Duryea, Lanchester, and the Arrol-Johnson (Mo-Car). The Duryea has a new type of gear, since last year, for giving the first and the "reverse" speeds, this being perhaps more on the lines of the Cadillac mechanism than of any other that we have described fully. The latest Lanchester car has the new 4-cylinder vertical engine placed horizontally between the dashboard and the front seat, so that the very narrow "bonnet" that covers it forms a partition between the footboards in front. The cylinders have a bore of 4 ins. and a stroke of 3 ins., and the speed is anything up to 2,000 revs. per min., while the epicyclic transmission mechanism and worm-driven back axle remain much as they were in a previous model, except that a multiple-disc main clutch is employed, and that a similar device constitutes a brake which is operated by the same hand-lever. The



AT OLYMPIA.—The 25-h.p. Thornycroft Car that has been built for H.R.H. Princess Christian.



AT OLYMPIA.—The 28-38-h.p. 6-cylinder "Belsize" Landaulette.

engine has its valves arranged on opposite sides, horizontally, and they are normally closed by flat steel springs, instead of by helical springs, the engine being thus kept extremely narrow. The Singer cars, which are quite proving to be amongst the chief attractions at Olympia, were very fully described by us last week. The Arrol-Johnston new model 3-cylinder vehicle chiefly differs from their already well-known dogcart in that the engine is arranged in front, the gear-box just behind the dash, and that there is one Renold's chain from the engine to gear, and another from the gear to the live-rear-axle; the chassis still conveys the same impression of originality in design as the dogcart, and the engine still has horizontal cylinders and a chain-driven cam-shaft. The Ryknield Company, who build twin-cylinder and 3-cylinder

cars of the live-axle type, and also a 24-h.p. 4-cylinder chain-driven model, exhibit a chassis of the last-mentioned pattern, in addition to other complete vehicles. The 4-cylinder engine has separate cylinder castings, and the inlet-valves, which have a variable lift device operated from the steering-pillar, are fixed immediately above the exhaust-valves. All the valves are operated from the same cam-shaft, which is fitted in such a way that it can be drawn out without dismantling the engine. The engine has an automatic governor which acts on the



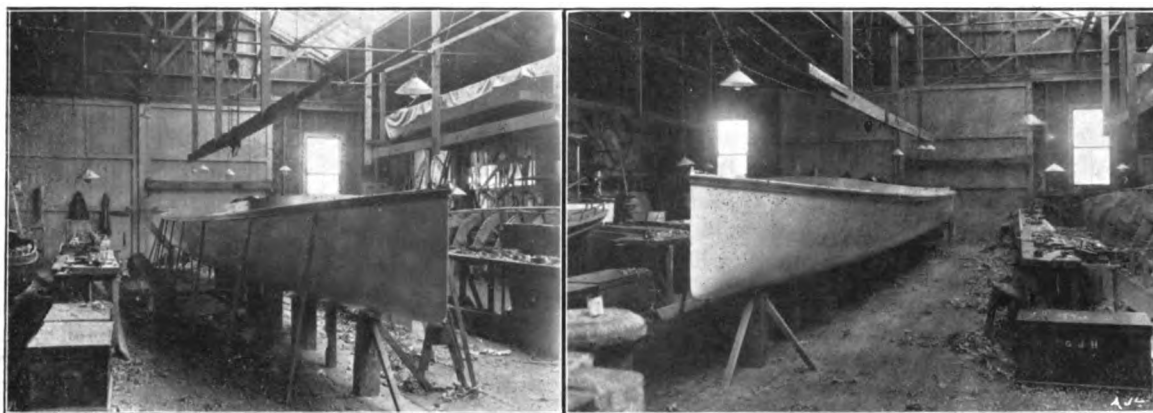
AT OLYMPIA.—The 24-h.p. Metallurgique Car, which is fitted with one of the most handsome and lavishly furnished bodies in the Show. The Chassis is of the live-axle type, has a spring-drive introduced in the transmission gear, and has an expanding metal-to-metal clutch. The inlet-valves have a variable lift device.

throttle-valve, the base of the crank-chamber is separately detachable, and a high-tension ignition system is employed. The chief features of the transmission-gear include an internal leather-faced cone-clutch, a change-speed-gear of the "Mors" type, in which there are bevel wheels both on the first and second-motion-shafts for obtaining a direct drive to the differential-gear, and a change-speed-lever which is fitted in somewhat the same way as that on the Daimler cars. The pressed steel frame is carried by a transverse spring at the rear, as well as by side springs. The steering-gear has a neat internal adjustment for taking up back lash between the feed-screw and the nut, and the two hand-levers that vary the time of ignition and the lift of the inlet-valves, respectively, are curved round the rim of the steering-wheel, so that they can be operated from above. On the Ryknield live-axle cars, the propeller-shaft is enclosed in a tube that is rigid with the back-axle casing.

Other interesting British vehicles of a similar nature

are those shown by the Albion and by the Simms Companies; since the 16-h.p. vehicle of the former maker's type is original in many ways we are at the present time devoting a separate article describing it. The Simms stall has been rendered particularly attractive by the "silver" chassis shown on it, this chassis having the entire metal work silver-plated and polished. It is of the live-axle type, with a 4-cylinder engine, and has the "Soames" change-speed gear fitted to it, this being, it will be remembered, a mechanism in which all the spur-wheels remain in mesh, and the different speeds are introduced by jaw clutches. Another Simms 12-15-h.p. chassis having an ordinary form of change-speed gear is also on view, and a noticeable fitting that it possesses is a dashpot, which is arranged in connection with the clutch fork in such a way as to prevent the clutch from engaging too fiercely.

(To be continued.)



AT OLYMPIA.—Two views of the Napier River Launch, nearing completion before leaving for Olympia. The hull is built on the Saunders patent sewn system, and provides seating accommodation for twelve persons.

THE TYRE EXHIBITS AT OLYMPIA.

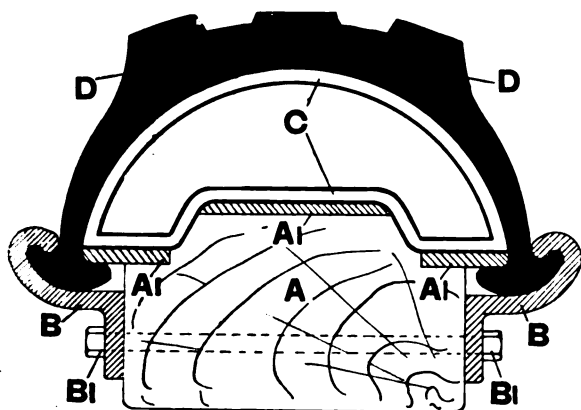
It is an advantage in many respects to have a definite part of the building reserved for the exhibition of tyres, and, in this, Olympia compares very favourably with last year's show at the Crystal Palace. So satisfactory are the best makes of present-day tyres, that novelties are hardly to be expected on the stands of such manufacturers, and, although the standard products are improved year by year, yet the results of this improvement are seldom of such a nature as to be visible at a glance, being mostly concerned with the processes by which the rubber is rendered suitable for tyres of motor vehicles.

Sixty Years Old.—Pneumatic tyres are somewhat different to-day from that relic of the past exhibited on the Dunlop Company's stand, this being no less than what is said to be actually the first pneumatic tyre ever made. It is recorded as being constructed under Thompson's patent in 1845, and is thus in its sixtieth year; although it can hardly be said that appearances belie its great age, yet it seems in no danger of falling to pieces, and should serve as an admirable foil to the up-to-date and hard-wearing products of the Dunlop Company for many years to come.

A Tyre for Heavy Touring Cars.—Those who travel in motor "caravans," fitted with conveniences

which almost rival those of a first-class hotel, probably realise at an early date that such *et ceteras* as tables, chests of drawers and folding beds, do not make for lightness, nor tend to reduce the cost of running the car, from the point of view of tyre upkeep. Even those who favour the large and comfortable tonneau, may find that roominess means weight, and that the vehicle is worthy of larger tyres. That a tyre of the right size, or a little larger, is the cheapest in the long run, is a rule that is now almost universally followed, and there will probably be many who will adopt the new 135 mm. tyre now introduced by the Continental Caoutchouc and Gutta-percha Company, in place of the 125 mm. which has hitherto been generally used on the heavier touring cars.

A Pneumatic 'Bus Tyre.—What is probably the largest pneumatic tyre yet constructed, is now an attraction at the Palmer Company's stand. This enormous pneumatic has an equivalent tread to that of a 10-inch tyre, although naturally its section is not similar to that of standard tyres. Our illustration shows the peculiar shape of the inner tube, C, and of the felloe, A, which it partly surrounds. The felloe has three steel rims, A', the inner one of which is of larger diameter than the outer two. The outer cover, D, is approximately semi-circular; the tread is formed by three parallel ribs, and



AT OLYMPIA.—Section of the Palmer Pneumatic 'Bus Tyre, designed to carry a load of 3 tons per wheel.

the heads, which are of the usual Palmer construction, are secured to the felloe by the flanges, B, and the bolts, B'. The tyre is designed to carry a load of three tons per wheel when inflated to a pressure of about 100 lbs. per square inch. It is constructed with the Palmer "airless cord" fabric, in the same way as their well-known and successful touring tyres.

Other makers of well-known pneumatics, who, even if they have no unusual features displayed on their stalls, have interesting exhibitions of well-made tyres, are the Collier Tyre Company, the North British Rubber Company, and Messrs. Michelin. The two features of the former firm, other than excellence of material, are the use of a particularly thick tread to the covers, and a positive bolt-and-nut fastening for securing the tyre in place on the rim. The latest form of Collier attachment was illustrated and described in our issue of March 5th last, and combines, it will be remembered, great security with a neat appearance. Collier tyres were fitted to the 28-36-h.p. Daimler supplied to H.M. the King in April of last year, and are reported not to have required any repairs all the time that they have been in use.

Solid Tyres naturally find many supporters among motorists, and the improvements which are effected in motor car construction—side by side with the improvements in the tyres themselves—give them increased chances of wider popularity every year. Solid tyres of one form or another are shown by Messrs. Dunlop, Reilloc, Conolly, Liversedge,

Sirdar and the North British Rubber Company, but the features of the specialities shown by each of these firms have been dealt with by us very fully in the past. It is noticeable what a large number of multiple-tyred wheels are exhibited for 'bus work and the like, and these are now made with as many as four separate tyres per wheel. Specimens of "used" tyres, having several thousand miles to their credit, were shown on many stands, and among these was a sample of a De Nevers grooved tyre, shown by Messrs. Liversedge, after it had run 15,000 miles. During the last year, this tyre has sprung up into considerable popularity, and the specimen referred to certainly tends to show that this method of construction does not endanger the useful life of the tyre.

Non-skids, on one or more wheels, are now so largely used, that they may be looked upon as part and parcel of the tyre itself. This is more especially true because the most popular of the non-skid devices are those which are interposed between the road surface and the tread of the tyre. Mechanical side-slip preventers do not, apparently, find great favour, and, so far as Olympia is concerned, non-skids practically resolve themselves into two classes, of which one is the well-known Parsons chain, and the other is the steel-studded leather bands, designed either to be detachable, or to be permanently vulcanised in place on the cover, such as those shown by Capt. Masui ("Samson"), Messrs. Sawyer, Grose, and the Otto Bennett Motor Company.



OLYMPIA EXHIBITION.—An interesting stand was that of the Dunlop Pneumatic Tyre Company, Limited, where not only the latest pattern tyres were on view, but the actual tyres used by Messrs. Jarrott and Girling in the 1904 Gordon-Bennett Race, and also that of the original Thompson pneumatic tyre, which was patented in 1845.

INAUGURAL LUNCHEON.

THE Exhibition was inaugurated by a luncheon, which was presided over by Mr. Sidney Straker. Among those present were Lord Stanley, M.P. (Postmaster-General), Colonel Sir Edward Ward, Sir Cuthbert Quilter, M.P., Earl Russell, Sir Albert Rollit, M.P., Sir Ernest Clarke, Colonel Holden, M. Ferdinand de Salis (*Chargé d'Affaires* for Switzerland), the Hon. J. Scott-Montagu, M.P., Sir H. Trueman Wood, Captain the Hon. Charles Fitzwilliam, Mr. W. J. Bull, M.P., Mr. Henry Norman, M.P., and the Mayor of Hammersmith.

After the loyal toasts had been duly honoured, Lord Stanley proposed "Success to the Society and the Exhibition." A year ago, he said, he had the privilege of proposing

that toast on a similar occasion, and the two things which he then put forward as being desirable in the automobile world had since come to pass. They were not his own opinions, but those of that useful person, "the man in the street." The first was that the Automobile Club should make itself—what it ought to be—the recognised and accepted authority by all those who, like himself, enjoyed the privilege of automobilism, and at the same time looked forward to the great chances the industry had of improving in the future our material prosperity (hear, hear). The second was that there should be co-operation between the club—which, so to speak, controlled automobilism—and the makers of cars (hear, hear). In the past twelve months the Automobile Club had undoubtedly



OLYMPIA EXHIBITION.—A stand that failed. With his usual enterprise, Mr. S. F. Edge had, for the Olympia Show, arranged for a truly magnificent decorative structure, costing £500. When put into place and the final touches were being given, Mr. Edge deemed it of such mediocre quality, and so wide of the terms of his contract, that he had the whole thing removed in the shortest possible space of time. He has sent us the above photograph of the erection partially finished, and although he points out that this looks very well in the photograph, the entire sign was badly constructed, whilst common gold paint instead of real gold leaf had been used.

established itself as the authority in the automobile world, and the best proof of the fulfilment of the second suggestion was that Colonel Holden, the chairman of the club, and Mr. Straker, the chairman of the Motor Manufacturers' Society, were sitting side by side at the luncheon. The other day a remark was made by an eminent judge—the Lord Chief Justice, he thought—to the effect that motor cars had come to stay, and that they were now an absolute necessity. So they were. They had ceased to be only the playthings of the rich; they would be to his mind one of the greatest contributors to the welfare and convenience of the poor.

He had been long enough in office to see in the postal world the growth of the use of automobilism.

He gave one instance of a contract he had signed within the last four or five days, which was typical of what would come, and was only the beginning of a great future. There was a postal service now running by mail coaches from London to Brighton. That was to be superseded by automobiles. What would be the effect? It would be possible to carry 50 per cent. more matter, greater facilities would be afforded for later postage at both ends by the extra speed, and the service would be cheaper than the old one. The contract had been undertaken by a great firm, which had been most enterprising in putting motor omnibuses on the London streets, and it might interest them to know that one of the provisions of the contract was that the mail carts should be on exactly the same chassis as the motor omnibuses, so that if a mail van broke down it would need only a very short time to remove it from one chassis to another.

He had told them what the Lord Chief Justice had said, but he would also like them to look at the other side of the picture. A letter appeared

in one of the papers written by a clergyman, who said he objected most strongly to the saying of the Lord Chief Justice, and that if automobilists were to go on they must have roads of their own. It was an extraordinary thing to him that the gentlemen who preached toleration on Sundays failed to practise it on other days of the week. The road belongs to the automobilist just as much as to the man who rode or drove in the streets, but there were restrictions placed upon them to which it was their duty to conform to the best of their ability.

As he said last year, they were on trial, and he ventured to think that in the twelve months they had just put behind them they had done much to mitigate the sentence that might be passed upon them by the House of Commons a year hence. On the whole, he thought the Motor Act had not worked badly. It was abused at the first; but it could not be held to have materially affected the prosperity of the motor industry.

There was one thing on which they might not all agree with him, but he would ask whether the effect of always jeering at what they called "police traps" was good for automobilists or fair to the police. He was certain that at the present moment the tendency of the police was not towards the setting of deliberate traps. He had received a letter from Mr. Henry, the Chief Commissioner of the Metropolitan Police, which he hoped would commend itself to automobilists of the United Kingdom. Mr. Henry regretted that the relations between motorists and the police were hardly satisfactory, and hoped that a better understanding might be arrived at. The Motor Act and the Parks Regulations required that a certain rate of speed should not be exceeded. The police were compelled to take action in the case of excessive speed, but they endeavoured to take action under conditions which would be absolutely fair to motorists. "No, gentlemen," Lord Stanley remarked, "it does not do to laugh. We have passed an Act in Parliament, and it is



OLYMPIA EXHIBITION.—What might have been a serious conflagration, on Friday, was fortunately avoided by the promptitude of a visitor, who, when near the United Motor Industries Stand, No. 234 in the Gallery, noticed that a fire had started, quickly called attention to it, and effectually got it put out. Our photograph gives a view of the stand, taken after the fire, showing the damage which was done. The contents of three cases, including many unique samples, were destroyed.

the duty of everybody to obey that Act." Every policeman and every head of the police was compelled to see that the Act was enforced. Mr. Henry's letter continued: "The distance over which the cars are tested is carefully measured, and two officers, each with a chronograph, are placed at either end of the measured distance, and when their timing shows that the speed of the car is well above the legal limit a third officer in uniform is signalled to stop the car and inform the driver. It may be noted (1) that officers have instructions, as a rule, to select their test distances on the actual level; (2) that they report when applying for permission to summon upon the state of the road, whether slippery or otherwise, and also whether the car has anti-skidding appliances. In deciding whether a summons shall be taken, consideration is given to the car having non-skidding appliances, which would enable the driver to effectively control it even on a bad roadway. Further, the chronographs used by the Metropolitan police, which are supplied by a competent watchmaker, are excellent of their kind, and are systematically called in for testing purposes. Should a test carried out

under such conditions be termed a trap; The police maintain that their attitude from the first has been to extend every latitude to drivers. Their only object is to ensure that the law shall be respected; they have no desire to enforce it by penal sanction, but are compelled to do so when prohibitions, which are well known to all persons using cars, are flagrantly ignored." In conclusion, Lord Stanley expressed the opinion that unless motorists kept the law, they would find the restrictions upon them, and upon the trade, to be much greater than before. He hoped that it would be possible to take some action by which they could eradicate from the ranks of chauffeurs all those who were guilty of malpractices.

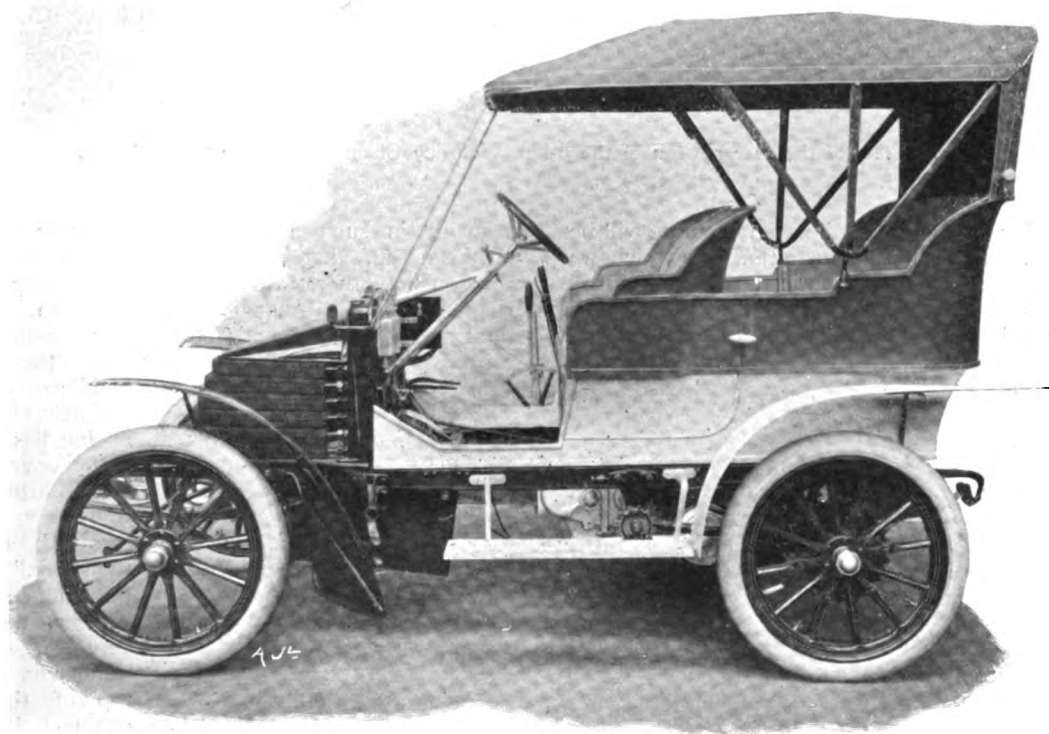
The chairman, in responding to the toast, gave some interesting figures, and mentioned that at the Exhibition, 300 firms were represented, and the cars shown were worth £700,000.

The only other toast was that of "The Press," proposed by Mr. Frederic Coleman in a witty and vigorous speech, coupling with it the names of Mr. Vincent (*The Times*), and Mr. Stanley Spooner (*The Automotor Journal*).



THE NEW 8-H.P. WOLSELEY CAR.

(Continued from p. 166.)



The new 8-h.p. Wolseley Car, fitted with a special Side-entrance type of body, in which the door is fixed to one half of the front seat, and the latter is fitted so that it can swing round about its centre, (The central portion of this car is shown with the door open in another illustration.)

THE inner ends of all four springs are attached to the main frame by a special form of guide, A, which allows them to slide freely, and has several advantages over the usual shackle. One of these guides is particularly prominent in Fig. 3—which is a view of the rear portion of the chassis from the left side. The front end of the front springs are, of course, hinged direct to the projecting spring-horn, and the back ends of the rear springs have shackles that allow for tightening the side chains.

The steering-gear is of the usual worm and segment type, the Company having abandoned the very ingenious

double-geared arrangement which was such a noticeable feature on their earlier cars; the steering pillar, it will be seen, passes right through the dash, and is rendered rigid with it by an aluminium stay-casting.

Although, in all respects, this chassis is of very substantial construction, the standard tonneau car only weighs about 13 cwt., and the space behind the dash is sufficient to allow for the very neat side entrance type of body that is seen in the illustration in the centre of this page; the front seat swings round with the door. The chassis itself weighs 11 cwt. without water or fuel.

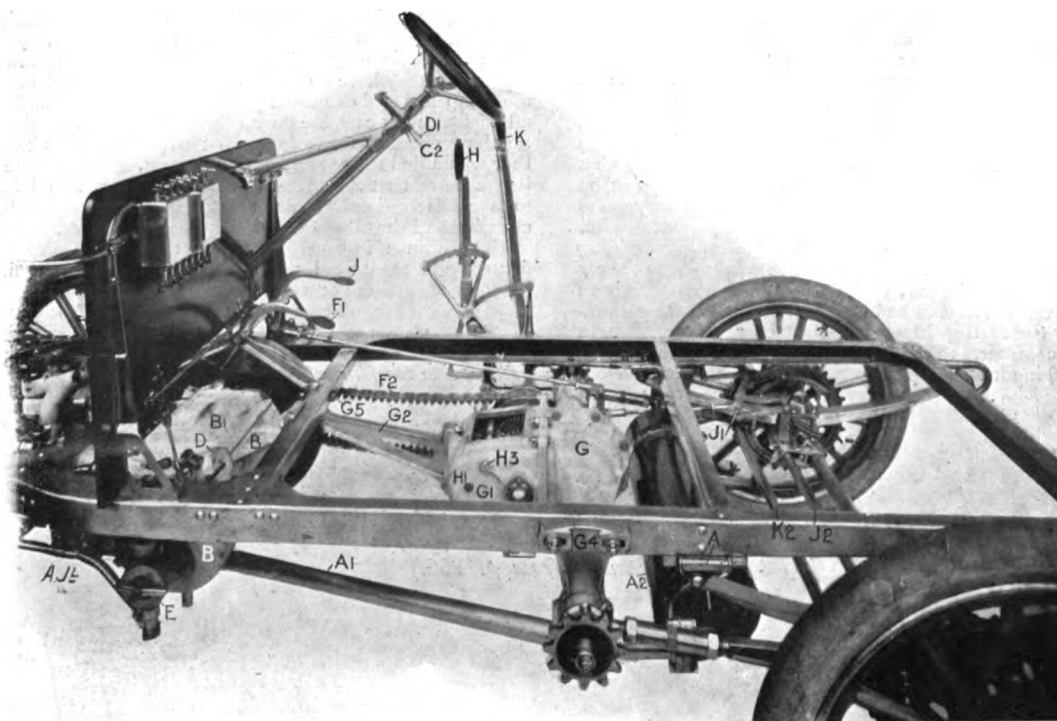


Fig. 3.—View of the rear portion of the 8-h.p. Wolseley Chassis, from the "near" side.

Of the actual construction of the engine, more will be said presently, but, from the illustrations to which we have already referred, it will be noticed that it is fixed at three points only to the two cross members of the frame which lie just behind, and just in front of the dashboard. The crank-chamber casting, B, has a central projecting arm that rests upon, and is bolted to, the former member, and the same aluminium casting is held at its other end—close up to the separately detachable and independently jacketed cylinder-heads—by a couple of bolts from beneath. The engine is extremely compact, and has both the commutator, D, and the water-pump, E, arranged so as to form an actual part of it, though both these gear-driven parts are particularly accessible on the car. Another special feature possessed by the engine is that the crank-shaft is supported by two bearings only. These bearings are

arranged in such a way that any wear can easily be taken up, that the two crank-pins are in line with one another, and have an extremely effective balance weight arranged between them, and that the two projecting ends of the crank-shaft carry, respectively, the jaw coupling for the starting-

handle and the main-clutch. The engine has no automatic governor, but is controlled entirely "on the throttle" and "on the spark." As will be noticed from Fig. 3, there is a very large inspection-cover, B', in the top of the crank-chamber, B.

Behind and in front, respectively, are fixed to the dashboard the sight-feed lubricator and the petrol-tank, from which the oil and the fuel flow by gravity. The petrol-tank has a capacity of 5 gallons, which enables the car to run about 140 miles without refilling, and the

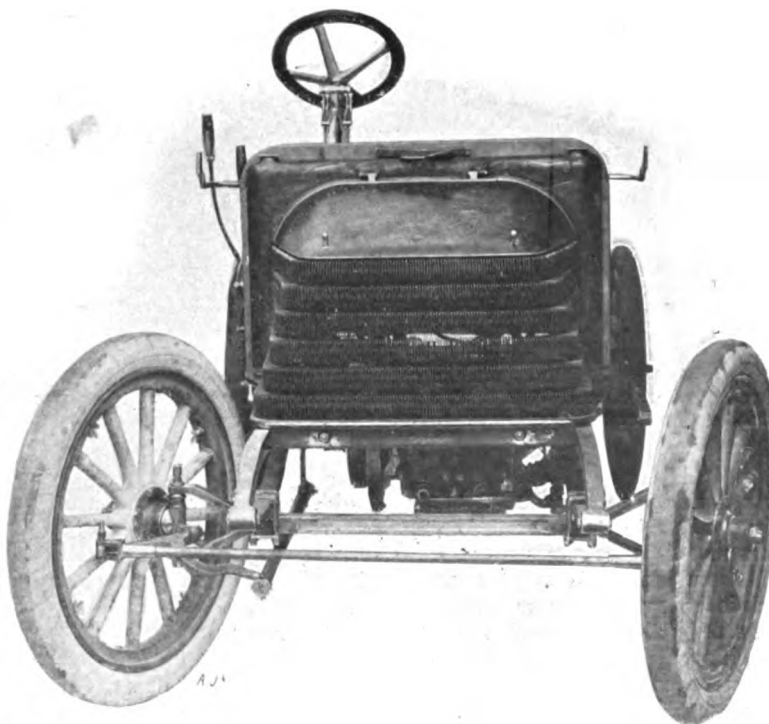


Fig. 4.—Front view of the 8-h.p. Wolseley Chassis, showing the Front Axle and the Steering-Heads, with the Wheels at "Full Lock."

lubricator holds sufficient oil for a full day's work. The whole of the water, for cooling the engine, is contained in the radiator, which, it will be remembered, is built up of finned, horizontal tubes, bent round to actually form the sides of the bonnet, and to connect the two aluminium water-bottles that are fixed to the dashboard, on each side; in our views of the chassis, the radiator has been removed, but those who do not recollect this well-known feature of all Wolseley cars, will find it prominent in Fig. 4 and in the photographs which we give of the complete vehicles. The exhaust-box, A², is fixed transversely behind the gear-box, and is connected with the engine by the pipe, A¹.

Combined with the throttle-valve, is an arrangement by which a constant richness of mixture is at all times maintained in the carburettor; the throttle-valve itself is not only controlled by the hand-lever, C³, on the steering pillar, but also by the brake-pedal, J. The engine is thus automatically slowed down before the brake is actually applied, and so a very convenient control is obtained with the single pedal. Another advantage of the new type of carburettor—the actual construction of which will be described later—is that it renders the inlet-valves very accessible.

Owing to the fact that the main clutch is mounted upon the crank-shaft—inside the flywheel, F—no end thrust is imposed by it upon the crank-shaft, when the clutch is in engagement. It is operated by the pedal, F¹, but, between the pedal and the clutch, is introduced a spring which enables the clutch-cone to be withdrawn more gradually, since the pedal has to travel a greater distance—during which time it is reducing the effective strength of the clutch-spring—instead of only moving a very little way.

The gear-box is rendered self-aligning in the frame by a three-point suspension, in much the same way as is the engine; but, in this case, it is also necessary to provide means by which it can be moved bodily backwards and forwards for adjusting the tightness of the silent chain, S²—by which the power is transmitted to it from the clutch. For this purpose the two brackets, G³ and G⁴—both of which are bolted to the side members of the frame—have slotted holes cut in them for the bolts to pass through, and the bracket, G²—which projects forwards from the gear-box—is held in place by a pin, G³, along which it can slide. The bracket, G³, on the right side, is visible in Fig. 6, where it will be noticed that it also forms the fulcrums and the quadrants for the gear-lever, H, and the brake-lever, K. The bracket, G⁴, on the left side, is equally prominent in Fig. 3, but only in the former illustration is shown the tightening screw, G⁵, by which these brackets may be forced along rearwardly to tighten the chain. These set-screws, however, are also seen in our photographs of the complete cars, and it will be understood that it is only necessary to slacken the bolts and to screw up the set-screws when the chain, F², requires tight-ening. In order, however, to ensure that both brackets are moved

to precisely the same extent, a divided scale is marked off upon them.

The gear-box is made in three parts, the two castings, G, enclosing the differential countershaft, from end to end, and the casting, G¹, enclosing the first motion-shaft. The countershaft itself carries the gear-wheels with which those on the first motion-shaft are alternatively brought into mesh—to give the four forward speeds—and therefore, by this construction, no additional second-motion-shaft is required. Fixed to the projecting end of the first-motion-shaft, is the chain-wheel, F³, by which it is driven, and, mounted upon it inside the box, are the two sliding sleeves that carry the four gear-wheels. The sliding sleeves are controlled by forks that ride on the shaft, H³, and these forks are operated by a cam-drum which is fixed to the shaft, H¹. The cam-drum is caused to rotate by the action of the toothed quadrant at the base of the change-speed-lever, H, because this quadrant meshes with the spur-wheel, H², on the shaft, H¹ (see Fig. 6). The grooves in the cam-drum are so shaped that they bring each of the four wheels into mesh consecutively, when the hand-lever is moved from its neutral notch to the full extent of its range forward, and it also controls the intermediate pinion that gives the "reverse" gear—when moved to the full extent of its range in the opposite direction. The first-motion-shaft, and the differential countershaft, are—like the road wheels—provided with ball bearings throughout, and it will be seen, from Fig. 3, that the extreme ends of the castings, G, not only support the

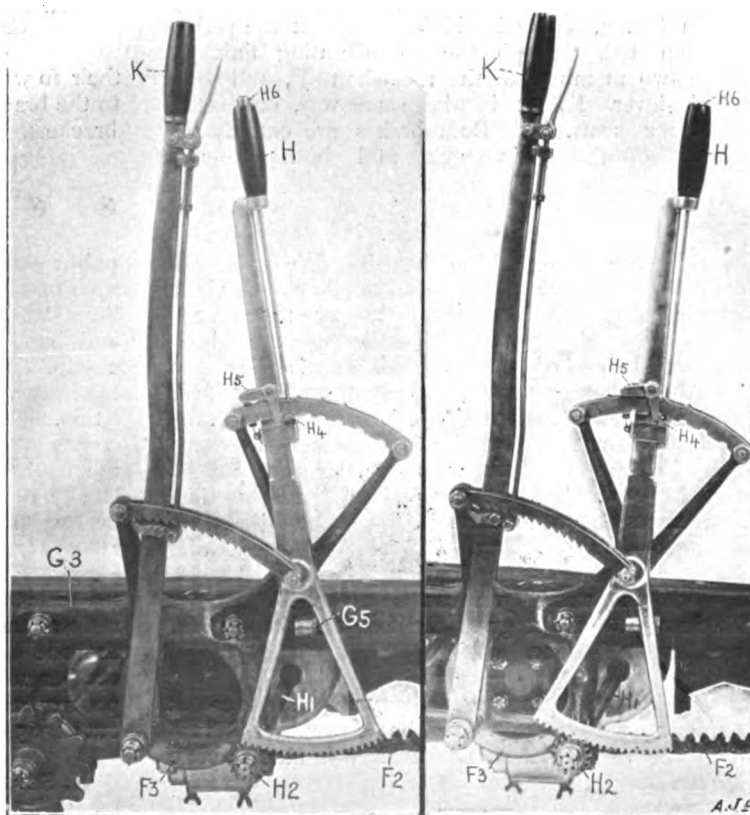


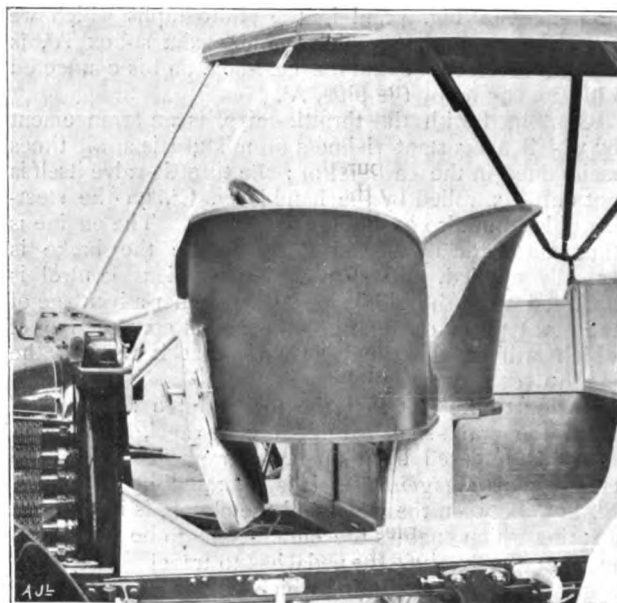
Fig. 6.—Two views of the Brake-Lever, and Change-Speed-Lever, on the 8-h.p. Wolseley Chassis, showing the Gear-Lever in one of its "locked" positions, and also in an "unlocked" position.

countershaft close up to the sprockets, but also form trunnions which fit inside the brackets, G^3 and G^4 . The end of the supporting bracket, G^2 , curves up inside the transverse member of the frame, and rides upon the bolt, G^3 , which also passes through that member.

In order to simplify the operation of changing speed, the very ingenious self-locking pawl-device, shown in Fig. 6, is fitted to the lever, H. By this device, it is necessary to depress the knob, H^6 , above the handle, before changing from one speed to another, and then the lever is rendered free to move in either direction, because the catch, H^4 , is withdrawn from the notch in the quadrant, and is held out by the locking-catch, H^5 . When the lever is so moved, the catch, H^4 , drops into the *next* notch, since there are projections on the quadrant that compel the other catch, H^6 , to release it. It is thus impossible to "run through" a gear by mistake. The four forward speeds on the standard chassis—which has twelve-toothed sprockets on the countershaft—represent 6, 12, 19, and 28 miles per hour, and the "reverse" gives the same gear-ratio as the "first" speed. With this vehicle, an average speed of 23 miles per hour can easily be maintained, on ordinary roads, with the full complement of four passengers, particularly as the load is so well distributed that there is comparatively little risk of side-slipping.

The foot-brake and the hand-brake both act direct upon the hubs of the rear wheels, the former being of the internal, metal-to-metal, expanding type, and the latter of the external pattern. Both pairs of brakes are compensated in precisely the same way, and both are carried by rock-shafts that pass across from the radius-rod on the one side to the radius-rod on the other. The arrangement of the brakes is, perhaps, most clearly shown in Fig. 3, where it will be seen that the pedal, J, is connected, through the compensating link, J^1 , with the two members of the rock-shaft, J^2 , and that the brake-lever, K, is, in the same way, connected with the rock-shaft, K^2 . Both brakes are entirely independent of the main-clutch, and both are not

only very powerful but are double acting. The internal brakes have adjustable stops provided for the expanding portions to rest up against, when they are in their "off" positions, and they are thus not only held clear of the drum, but are also prevented from rattling. The radius-rods—it will be noticed—have the necessary right-and-left-hand thread adjustment fitted close up to



View of the central portion of a Special 8-h.p. Wolseley Car, showing the side-entrance door open.

their forward ends, and, instead of being merely hinged to the brackets, G^3 and G^4 , they actually ride about those brackets.

(To be continued.)

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Tyre-Fitting Competition at the Olympia.—In order to demonstrate to motorists how quickly a punctured tube can be replaced by a spare tube on the road, a competition for prizes is, as we announced recently, being carried on at the Olympia Show, and is open to all chauffeurs and drivers. The competitors have to take out the tube of a Continental tyre, substitute a fresh tube and pump up, and the winner is the competitor who does this in the shortest time. Each day hundreds of visitors have watched the competition, and the time taken averages about ten minutes. The best times yet made are:—A. W. Merry, 6 mins. 41½ secs., and G. Pallet, 7 mins. 1½ secs. This demonstrates the ease with which pneumatic tyres can be detached. At the Berlin Show now in progress the fast time of 6 mins. 30 secs. has been done.

LAST Friday afternoon a gentleman's overcoat "disappeared" from Stand No. 62, Olympia. Return of the same to Mr. E. H. Lancaster will much oblige the owner.

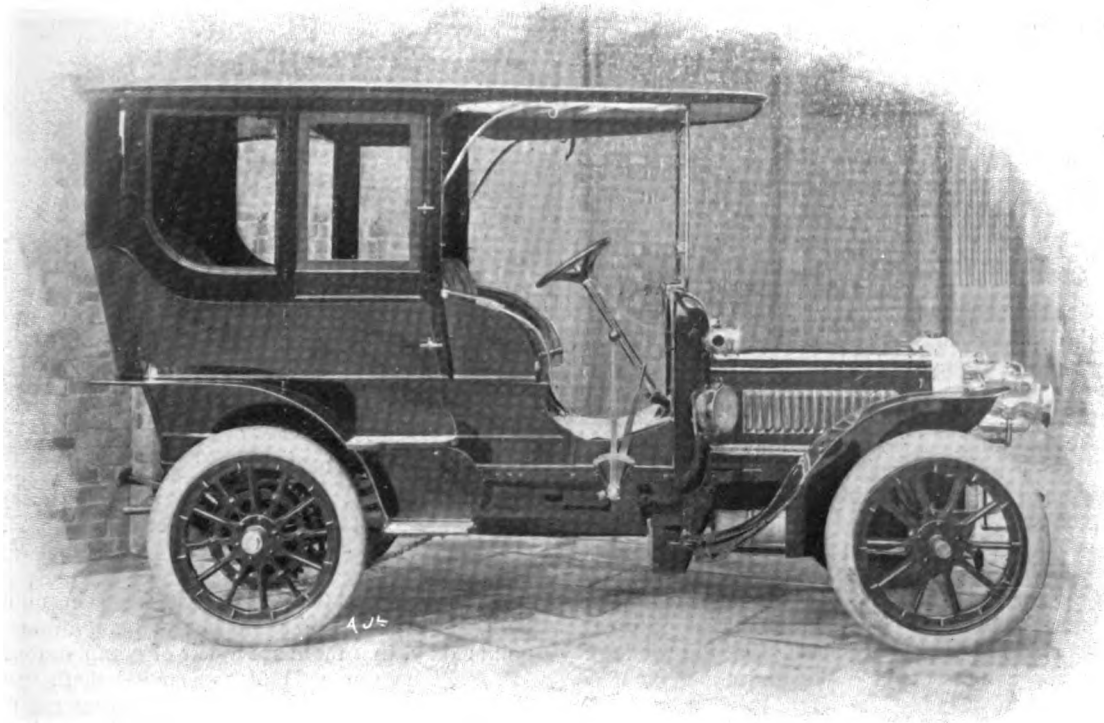
M. SERPOLLET is singularly enterprising and energetic, and he has recently been demonstrating one of the great advantages of his system—that it can consume any kind of fuel. This is, of course, a very great advantage for

public service vehicles, and to demonstrate how cheaply such machines can be run on the Serpollet system, M. Serpollet recently carried out a run from Paris to Rouen and back again with a Serpollet omnibus driven by a 20-h.p. engine. The fuel employed on this run was the heavy oil obtained from ordinary coal tar by distillation. This oil is the product of distillation which comes off after the benzenes, toluenes, "sharp oils," and the naphthalene have been distilled, and consist very largely of creosote oil, practical demonstrations in the heating power of which have, on the occasion of the recent fog, been supplied by the London County Council—the flares which they have put at street corners being fed with these oils. The amount of fuel used during the run was carefully measured, and amounted to 31 litres in the one direction and 29 in the other. Working this out per number of passengers carried, the cost of transporting each passenger to Rouen and back again worked out at '65 of a franc (about 6d.)

M. SERPOLLET has since been extending his experiments further, and with one of these omnibuses recently climbed the celebrated Montmartre Hill, to the great astonishment of the inhabitants. He has also two specimen cars and two specimen 'buses running between Nice, La Turbie, and Mentone.

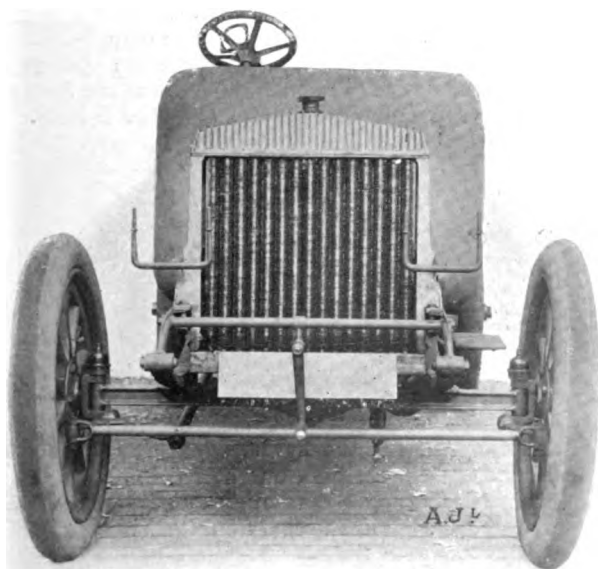
THE 1905 DAIMLER CARS.

(Continued from page 161.)



One of the new 28-36-h.p. Daimler Cars, fitted with Limousine Body.

COMING now to the leading features of the new 28-36-h.p. chassis, a rear view of which is given in Fig. 3—to supplement Figs. 1 and 2 of last week:—The main frame is constructed of armoured wood, the steel fitch-plates



Front view of the 28-36-h.p. Daimler Chassis, showing the Front Axle, Steering-heads and Radiator.

forming the tapered side-members of which lie edge-wise, and are bent so as to give the maximum strength where it is most required. Behind the dash, the wooden members are placed outside these fitch-plates, whereas, in front of the dash, short steel girders are riveted to them, to form ledges for the engine to rest upon. The fitch-plates are thus quite straight throughout their length, and yet the frame is narrower in front than behind. The spring-horns project from the ends of the side-members, and the frame is carried on the usual semi-elliptic side-springs—which at the rear are very long, and lie outside; these rear springs are 4 ins. longer than last year. The front axle, which has an I cross-section, is provided, at each end, with a steering-head of a new type, that is very neat and strong. The forgings that form the stub-axles are bifurcated,

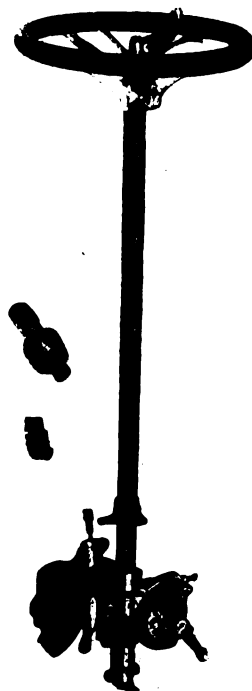


Fig. 4.—The Steering Pillar on the 28-36-h.p. Daimler Car, with the Gear exposed to view; also showing the Worm and Toothed Segment, separately.

instead of the axle itself, and the joint is so fitted that comparatively little dust can enter. The back axle, which is quite straight, is made from bar steel, instead of being forged; it is connected with the main frame in the usual way by radius-rods at each side. All four wheels have 35 ins. by 5 ins. pneumatic tyres, and are mounted upon ball bearings.

The steering-gear is shown in Fig. 4, with the casing surrounding it opened up to show the interior. It will be noticed that a single lever, A^1 , is fitted above the steering-wheel, and that this moves over a quadrant, which does not turn round with the wheel. This one lever controls the power and speed of the engine—which has no automatic governor—by simultaneously opening or closing the throttle-valve, while it advances or retards the ignition. The connections between the steering-gear and the front wheels have ball joints with spring buffers.

The general arrangement of the chassis is best shown in Fig. 2, where it will be seen that the radiator, B^1 , forms the front of the bonnet, with the belt-driven fan, B^2 , immediately behind it; that the engine occupies the usual position in front of the dash; that the whole of the mechanism is protected on the under-side by very neat dust-proof casings; that the gear-box, H , is mounted nearer the back-axle than usual; and that consequently there is quite a long propeller-shaft, G , between it and the main-clutch. On either side of the shaft, G , are the battery-box, C^2 , and the coil-box, C^3 —both beneath the floor—while to the left, and to the back, of the gear-box are two silencers, L and L^1 , through which the exhaust-gases are led consecutively from the expansion-chamber alongside the engine. The 14-gallon petrol tank, A^2 , is fixed quite at the rear of the frame, and the feed from it to the carburettor (A), is by pressure derived from the exhaust. It will also be noticed, in the same illustration, that a stationary clutch-spring, F^1 , is employed, and that this is fitted in a particularly accessible position for adjustment.

Other features which are also visible in these general views, but of which more will be said presently, are that the gear-box proper lies behind the differential counter-

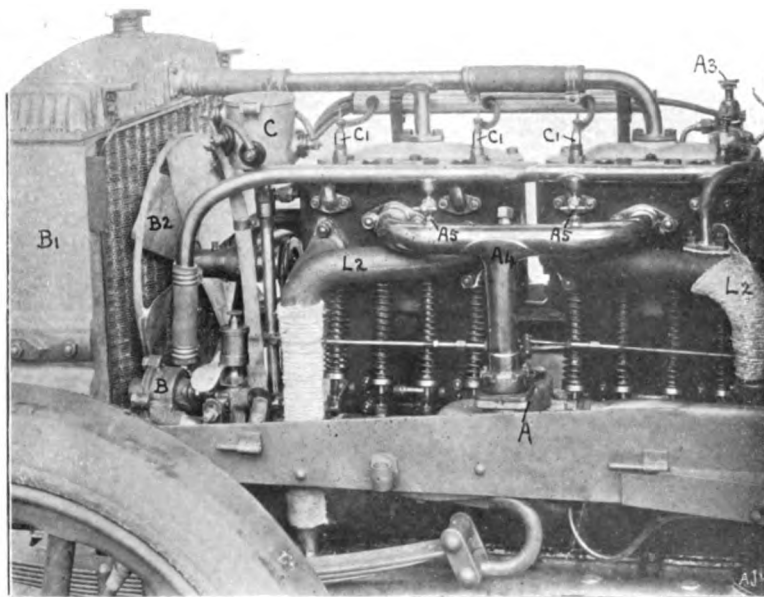


Fig. 5.—View of the Engine on the 28-36-h.p. Daimler Car from the "near" side, showing the positions of the Carburettor, Pump, Radiator, and Fan.

shaft, instead of in front of it, that the casings containing both these parts are fixed to the main-frame at three points only, that there are a pair of compensated brakes, M^1 , fitted on the ends of the countershaft, and that a similar type of hand-brake, N , acts direct on the hubs of the road wheels. To the right of the engine, is seen the reservoir, D , for the lubricating oil, and above it is the pressure valve, A^3 , that enables the exhaust gases to force the oil up, from it, to the lubricator, D^1 , on the dashboard. This lubricator supplies the oil to the cylinders and to the crank-chamber, and it has a neat cam-plate arranged above it for turning on or off all three feeds simultaneously. The clutch-pedal, F , and the brake-pedal, M , are arranged in the usual positions, the former controlling the leather-faced cone-clutch that is fitted inside the flywheel, and the latter acting upon the two countershaft brakes; the clutch-fork has a double-ball thrust-bearing, and there are springs introduced between the aluminium cone and the leather face to prevent the clutch from engaging too fiercely.

(To be continued.)



THE 16-H.P. ALBION CAR.—PART II.

The Engine.

THE engine, seen from the left side in Fig. 3, has its cylinders cast in one piece, with the valve-chambers arranged on opposite sides. The top of the water jacket is formed by an aluminium plate, and the inspection-covers over the valves are held in place by yokes to facilitate their removal. The mechanically-operated inlet-valves lie on the left, and the external fibre and brass gear-wheels which drive the cam-shafts are situated behind the crank-chamber. The bore and stroke of the cylinders is $4\frac{1}{4}$ ins. and 5 ins. respectively, while the engine is governed, and may be set, to run at any speed

between 200 and 950 r.p.m. The cranks on the crank-shaft lie at 180° , and balanced weights are fitted to compensate for the rotating masses. At the rear end of the crank-shaft is the flywheel, in which is the leather-faced cone-clutch, and, on the front end, is keyed the magnets, forming the rotating part of the low-tension magneto, E . Wires are led from the stationary armature of the magneto, through a switch, to the igniters, D , which project diagonally into the walls of the inlet-valve-chambers. The igniter tappet-rods are worked by vertical striking-rods, D^1 , which are enclosed in tubes, D^2 , and are operated from the inlet-valve cam-shaft.

The "timing" of the ignition is effected by altering the position of the heel, against which the lower ends of the striking-rods are pressed by the friction of the revolving-cam. The "timing" is not under the driver's control, but is effected by the governor through an inter-connection with the "timing"-levers, D^3 , which are connected together by the link, D^4 , and are operated through the rod, D^5 , from the governor-lever, B^2 .

On the front end of the governor-spindle is a centrifugal pump, F , which draws water from the bottom of the radiator, and circulates it through the cylinder-jackets, the water entering at the front end of the casting and leaving by a pipe connection in the aluminium plate forming the top of the jacket. Separate oil pipes are led to all the engine bearings, and also to the cylinder; the lubricating-oil tank is carried on the front of

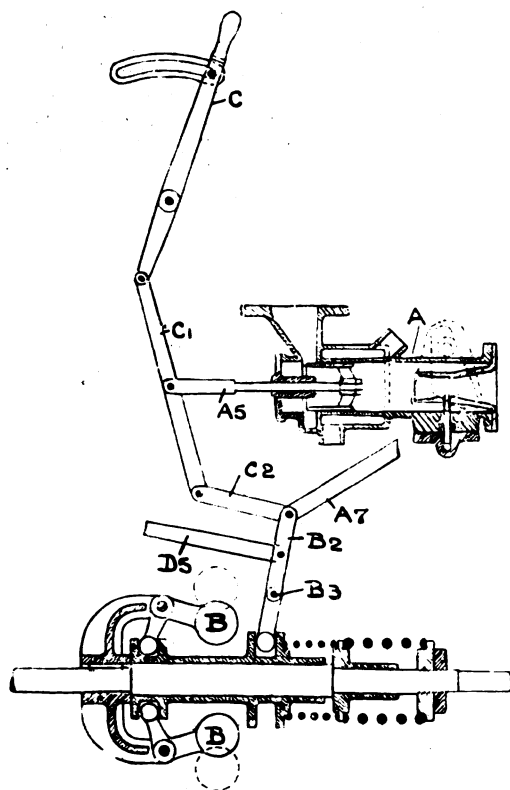


Fig. 5.—Diagram of the Albion Control System, showing the interconnections between the Governor, Throttle, Auxiliary Air-Valve on Carburettor, and the "Timing."

the dash, and pressure is maintained in it by a branch pipe from the exhaust. The exhaust gases are now led by separate pipes from the engine to the silencer, as it was found that the tee-piece—originally used—caused a certain amount of back-pressure in the first cylinder.

The governor is a very important feature on the Albion cars, for it is relied on both to regulate the speed of the engine and to adjust the "timing" of the ignition. For this purpose, the travel of the governor-sleeve has to be of considerable length, in order to enable it to be efficient as a control throughout a wide range of speed. The governor-spindle is shown separately in Fig. 4, and it will be noticed that the balls, B , are connected to the sleeve by an arrangement of bell-crank-levers and links which enables them to give

the sleeve the necessary long travel. When in place on the engine, the governor-spindle is mounted horizontally alongside the inlet-valve cam-shaft—from which it is gear-driven—and is enclosed in the case, B^1 . In the top of the governor-case, B^1 , is the bearing, B^3 , forming the fulcrum for the governor-lever, B^2 , which is interconnected with the "timing" and the throttle, as already mentioned.

The system of levers operated by the governor is diagrammatically shown in Fig. 5. At 180 revs. per min. the governor-sleeve commences to close the throttle-valve, and to advance the ignition, until the engine runs steadily at about 200 revs. per min. Any increase above this speed is effected by the driver moving the lever, C , which is interconnected with a hand lever on the steering-column. The lever, C , is connected by two links, C^1 and C^2 , with the governor-lever, B^2 , but the effect of moving it does not alter the position of the governor-lever, for that merely forms a fulcrum whereby the throttle may be opened through its interconnection with the link, C^1 . It will be seen, therefore, that although the throttle may at any time be positively opened or closed, independently of the governor, the engine is, nevertheless, governed at all times, for, if opening the throttle increases the speed of the engine, the governor at once continues to operate the lever, B^2 , and so tends to close the throttle once more. It is not necessary, however, to keep altering the position of the lever, C , when speeding up the engine, because, although the actual movement of the throttle from closed to full bore is only one-eighth of the total travel of the governor-sleeve, yet there is sufficient overrun in the throttle-valve-guide to enable the control-lever, C , to be set once and for all, so that the

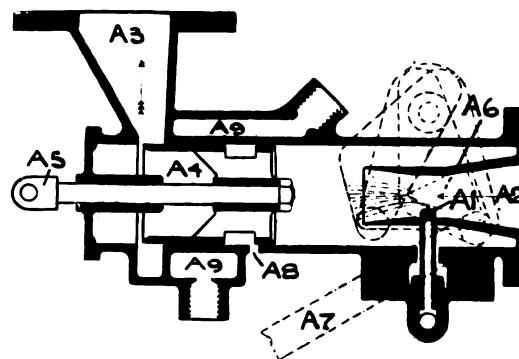


Fig. 6.—Sectional Elevation through the Mixing-Chamber of the Albion Carburettor.

governor only commences to close the throttle at any desired speed up to its limit of about 950 revs. per min.

The carburettor, A , the position of which on the engine can be seen in Fig. 3, is of the "automatic" type. It has, however, two auxiliary air valves, and, unlike the majority of these devices, both valves are mechanically operated. A sectional elevation through the mixing-chamber is given in Fig. 6, but the float-feed-chamber—which maintains a constant level of the petrol in the jet—is not shown. The jet, A^1 , it will be noticed, is surrounded by a coned intake, A^2 , through which the main supply of warm air enters on its way to the engine through the throttle-valve, A^4 , and the induction-pipe fitting, A^3 . The throttle is of the piston-valve type, and has a port cut in its wall for the purpose of admitting auxiliary air at full load. This port is brought opposite

to a similar opening, A^5 , in the wall of the mixing-chamber, which communicates with the atmosphere, but these ports only coincide and admit air when the engine is working with an open throttle. Originally, this port was not fitted in the Albion carburettor, and the whole supply of auxiliary air was taken through another port, A^6 , which is directly controlled by the governor through the link, A^7 . This valve is still retained, and admits auxiliary air in proportion to the speed of the engine. As first fitted, however, it was found that the range was too limited, for at high speeds and light loads the mixture became too weak, and in "speeding up" it was found that the engine received insufficient air in the initial stages. To remedy this, the auxiliary air-port, A^6 , was reduced in area by one-third—which got over the difficulty of weak mixtures at high speeds—and a port, A^8 , equal in area to the reduction made in the port, A^6 , was introduced into the throttle—which successfully overcame the other trouble of insufficient air in the initial stages of speeding up the engine.

Unlike the majority of cars in which low-tension ignition is employed, the Albion magneto is designed as an integral part of the engine, and is constructed in the same factory as are the cars themselves. In design, too, this magneto is quite unlike the majority of such devices, as will be seen from the drawings in Fig. 7—which show an elevation, an end view of the complete apparatus, two views of the armature, and, in the lower part of the illustration, a diagram of the electrical connections between the armature and the low-tension igniters.

The magnets, E^1 , are carried by a brass spider, E , which is mounted directly on the front end of the crank-shaft, and thus forms the only moving member of the whole apparatus, for the armature is held stationary by a bracket fixed to the crank-chamber. The magnets, E^1 , consist of two flat steel bars placed parallel to one another on either side of the crank-shaft. The pole-pieces, E^2 , are of cast iron, and are bolted directly to the ends of the magnets, and they are so shaped that they project backwards and overlap the full width of the armature core, E^4 . The armature core is of laminated construction, being built up of a number of thin insulated soft iron plates stamped in the form of a circular horseshoe. Directly opposite the gap in the armature-core is the armature-coil, E^5 , and in this position it comes exactly under one of the pole pieces, E^2 , when the other pole piece bridges the gap. At this instant the magnetic "lines of force" are reversing their direction through the iron core of the coil at the greatest rate, and consequently the magneto is then generating most electricity, and at or about that position the spark is "timed" to take place. The magneto itself is not "timed," but is made sufficiently large to be effective at all positions within the "timing" range. Being keyed directly to the crank-shaft there is no trouble in resetting it in the event of removal, and the fact that the magnet is the only moving part renders the apparatus particularly simple.

(To be continued.)



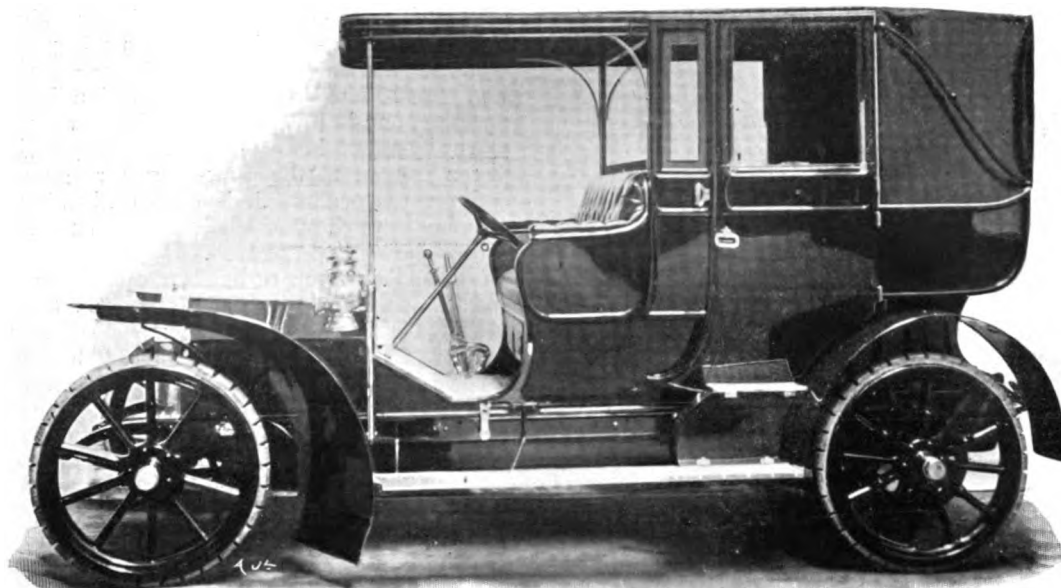
Leeds Rebuffed.—The application of Leeds to the Local Government Board to enforce a speed limit of 10 miles per hour within a radius of two miles of the centre of the town, has been most emphatically refused by the Local Government Board. We are glad to see that Mr. Long, in announcing this decision, based upon the evidence brought before him, made some very trenchant remarks in regard to applications of this kind. Mr. Long points out that restrictions of the nature desired should only be made with a view to the safety of the public where the general provisions of Section 1 are found insufficient to secure public safety. Mr. Long continues as follows:—

"In considering such of the applications under Section 9 which have come before him, as have proposed that restrictions should apply to whole areas of local government or considerable parts of them, Mr. Long has been unable to satisfy himself in any case up to the present that the regulation was wholly necessary. In almost every town there are probably individual places or stretches of roads where from one cause or another motor cars or other vehicles must usually proceed with care and at a slow speed—frequently less than ten miles an hour—but, on the other hand, when roads, even though they be streets of a town, are clear, it is impossible to say that the safety of the public requires that a speed of ten miles an hour should never be exceeded. In all cases a motorist who drives recklessly, negligently, or to the danger of the public, is liable to be proceeded against under Section 1 of the Act.

"No doubt there is much traffic in the portion of Leeds in respect of which the application is made, and from the nature of the traffic a high rate of speed must often be impracticable. It is, however, to be observed that the suggested regulation would establish not an average standard of pace but a maximum, which it would be illegal to exceed, and it is to be remembered that where there is a large amount of traffic in a given area, the more rapidly any portion of it can proceed the sooner is the congestion relieved."

The Park Speed Limit.—The 10-mile speed limit in the London Parks still continues to exercise the Metropolitan magistracy, and is not yet finally decided. Originally, as our readers will remember, the defence was raised in a case before Mr. Kennedy, that the notices put up in the parks by the police had no authority whatever, not having been properly laid before Parliament in accordance with the Act. A similar case came last week before Mr. Marsham, who agreed to adjourn it until Mr. Kennedy should give his decision. Since then, however, the Metropolitan magistrates have held a consultation, and decided that Mr. Marsham should decide the matter. Some ten of the adjourned cases accordingly came before him on Tuesday last. Under ordinary circumstances he would have delivered judgment, but a surprise was in store. Without any notice whatever to the defence, the Public Prosecutor instructed Mr. Bodkin to plead the case, and though it was really closed at the last hearing, Mr. Marsham allowed it to be reopened, and permitted Mr. Bodkin to attempt to show that the Police Park Regulations, as promulgated, were all that they should be. Mr. Staplee Firth, after protesting against the reopening of the case in this way, replied at length, maintaining that the police regulations in question are precisely those contemplated by the Act, and must, to have legal validity, have been duly laid before both Houses of Parliament. Mr. Marsham was unwilling to trust himself to give a decision at once, and announced that he would reserve his judgment, so this very important question still remains undecided.

THE 20-H.P. BROTHERHOOD PETROL CAR—PART III.



The 20-h.p. Brotherhood Landulette that has been built for Countess Amhurst.

The Carburettor and the Petrol Supply.

THE petrol is fed to the carburettor under pressure from the tank, A², at the back of the frame, and this tank—which has a sufficient capacity for running about 200 miles—is made of corrugated brass, which is tinned on the inside. The use of corrugated metal enables the weight to be reduced, owing to the greater strength obtained, and, incidentally, it may be remarked that the unusual appearance it bestows on the rear view of the car will probably prove one of the distinguishing marks for Brotherhood vehicles. The pressure is maintained in the tank by a very substantial valve-fitting, A⁶, which is connected with one of the exhaust-pipes, and is fixed to

the front of the dashboard. On the other side of the dashboard there is an auxiliary hand-pump, as well as a pressure gauge. Both the pressure-pipe and the petrol-feed-pipe enter the tank together, at the top, and, on the under side, there is a sump and a strainer, with a large detachable cap beneath them for emptying or cleaning out the tank. The tank can be filled from the back of the car, through a combined funnel and filter fitting that is fixed to it, so that the petrol may be poured straight in from an ordinary can, without having to use any separate funnel for the purpose.

The construction of the carburettor is well shown in Figs. 16 and 17, the former of which is reproduced from a photograph of one which had been cut open to show

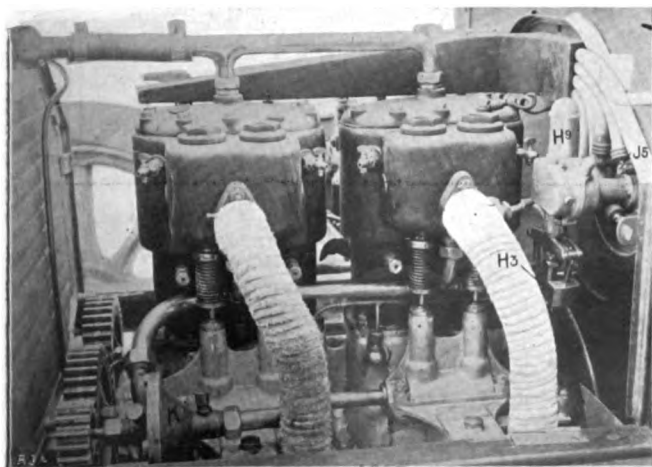


FIG. 14.—View of the Brotherhood Engine—fixed in place on the Chassis—from the “near” side, showing the Exhaust-pipes, the automatic Timing-gear, and the Circulating pump.

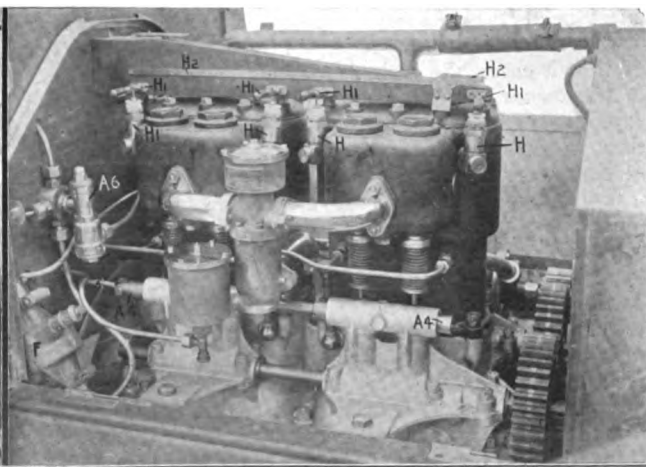


FIG. 15.—View of the Engine—in place on the Brotherhood Chassis—from the “off” side, showing the automatic Carburettor, the Ignition-plugs with their Switches, the Pressure-valve, and the Variable-lift Mechanism for the Inlet-valves.

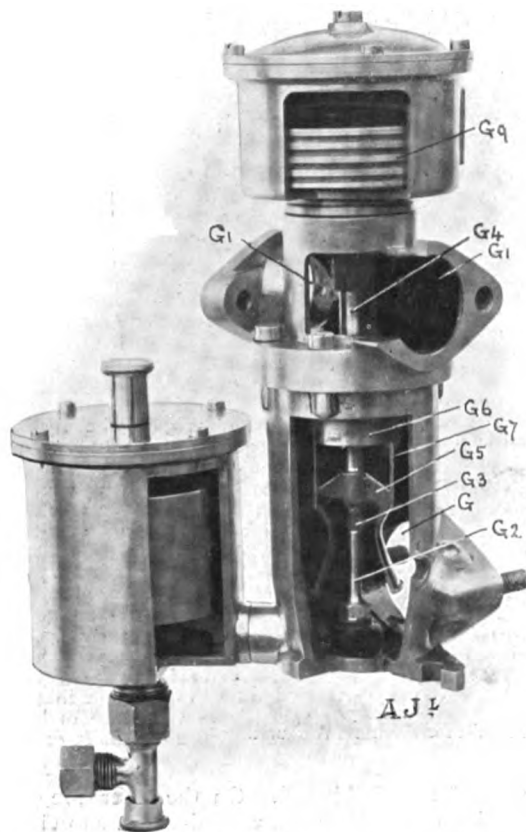


FIG. 16. — View of the Brotherhood automatic Carburettor, cut open to show the interior.

the interior. One of its special features is that the effective size of the spray-jet, the area of the air passage surrounding the jet, and the quantity of auxiliary air that is allowed to enter the induction-pipe, without passing around the jet, are all simultaneously, and automatically, regulated by the suction in the mixing-chamber. And another characteristic is that there is a comparatively small passage leading from the mixing-chamber to the suction-cylinder, with the result that very much the same effect is obtained as with an ordinary dash-pot. Referring to our illustrations, it will be seen that the whole of the air enters the carburettor from the neighbourhood of the exhaust-pipes, through the port, G, and that the explosive mixture passes out to each pair of cylinders through separate ports, G¹. The spray-jet, G², has a hole of comparatively large diameter drilled through it, and it projects up from the base of the mixing-chamber in much the usual way. Fitting down inside the spray-jet is a long needle-valve, G³, which has two flats—filed on opposite sides—to form tapering faces along that portion of it which fits inside the spray-jet. The needle, G⁴, can be adjusted relatively to the tube, G⁴—through which it passes freely—by a nut at the upper end (as seen in Fig. 17), and this tube, G⁴, carries a conical sleeve, G⁵, as well as a cylindrical sleeve, G⁶, in such a way that these two sleeves travel upwards or downwards along with it and with the needle. The conical sleeve, G⁵, surrounds the spray-jet, G², and fits inside a stationary cylinder, G⁷, that acts as a guide for it. The other sleeve, G⁶, also slides inside the cylinder, G⁷, and normally covers ports, G⁸, that are cut through the cylinder-

wall, but it commences to uncover these ports as soon as it begins to be moved upwards with the tube, G⁴.

The tube, G⁴ (and therefore the needle, G³, and the two sleeves, G⁵ and G⁶, also), is rigidly fixed to a piston, G⁹, that is free to slide inside a cylindrical chamber fitted above the mixing-chamber, and it is this piston which—although normally held down by the spring seen in Fig. 17—is acted upon by the suction in the mixing-chamber, and is then caused to rise to a greater or less extent by atmospheric pressure. The space beneath the piston is open to the atmosphere through small holes, and the space above it is connected with the mixing-chamber through other small holes, that lead into each end of the tube, G⁴, as seen.

The action of the carburettor causes the sleeves, G⁵ and G⁶, as well as the needle-valve, G³, to assume the positions indicated in our illustrations, when the engine is at rest, and then the whole of the air entering at G is compelled to pass up between the jet, G², and the sleeve, G⁵, on its way to the engine. The restricted area around the top of the jet tends to produce a considerable injection action upon the petrol, and this is needed because the two orifices—formed between the needle, G³, and the jet, G²—are at the time reduced to their minimum size. After the engine has been started, the suction produced in the mixing-chamber would normally cause the mixture to become abnormally rich, unless some re-adjustment were to be made, because, not only would a larger proportion of petrol be drawn up through the jet, but the engine would also be unable to obtain full charges of air in consequence of the throttling action of the sleeve, G⁵. The suction, however, causes the piston, G⁹, to rise in its cylinder, and, in doing so it opens the ports, G⁸,—allowing a certain

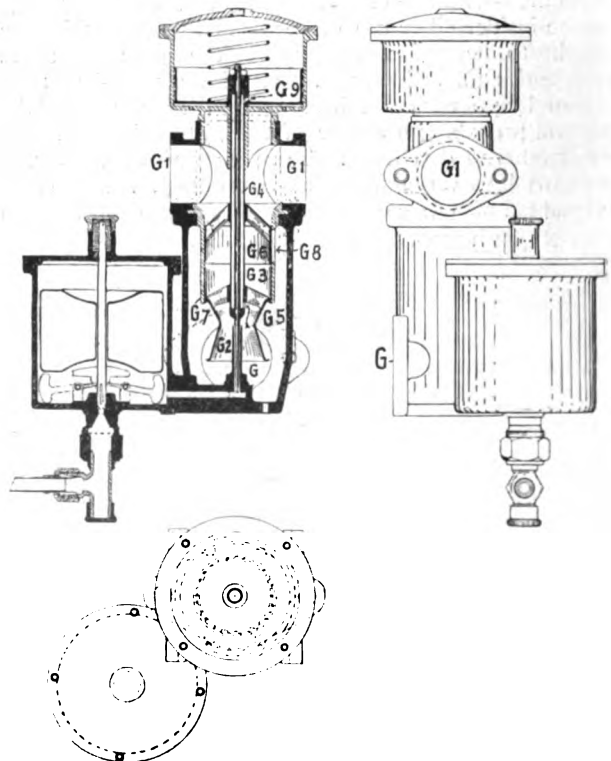
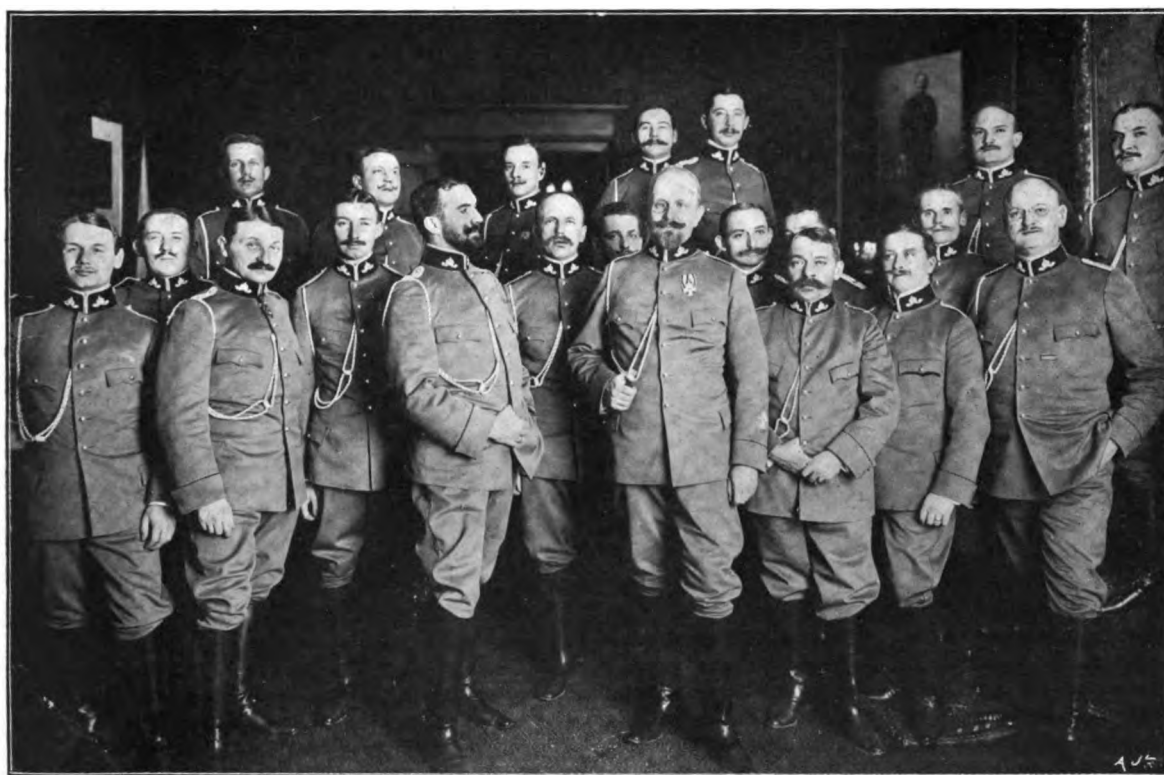


FIG. 17. — Section, Elevation, and Plan of the Brotherhood automatic Carburettor.

amount of auxiliary air to enter the carburettor above the jet—and simultaneously raises the sleeve, G^5 , thereby increasing the size of the annular space around the jet. At the same time, too, the effective area of the jet itself is increased, thus allowing more petrol to flow through it, although the suction is approximately the same. For these reasons, it will be seen, therefore, that although a greater quantity of mixture can pass to the engine—to suit higher speeds, or increased “lift” of the inlet-valves—yet its richness is maintained approximately constant. Theoretically, of course—even if the shape of the needle-valve, G^3 , were correctly proportioned with respect to the sleeves, G^5 and G^2 , and to the ports, G^3 —there would be a slight increase in the

degree of suction in the mixing-chamber when the engine were to run faster, since it obviously takes a little more pressure to raise the piston, G^2 , a further stage upwards, in view of the fact that the strength of the spring which holds it down becomes greater the more it is compressed. Approximately, however, the required richness of mixture is maintained, in spite of variations of engine speeds, and in spite, too, of the action of the variable-lift valve-device that controls the quantity of mixture required at any given speed. In practice, at any rate, this new automatic carburettor appears to give excellent results, and the actual “torque” that is developed by the engine varies but little over an extremely wide range of speed.

(To be continued.)



The Automobile Volunteer movement is making almost more progress in Germany than in this country, and the corps of automobile volunteers attached to the German army now numbers 21 members, whose portraits, by the courtesy of the “*Allgemeine Automobile Zeitung*,” we are enabled to give above. All the members of the corps are looked upon as equal to one another, all having the rank of officers of the same standing, though the whole corps is under the command of Prince Henry of Prussia, who is its official head. The tall officer in the centre of the picture is Baron von Brandenstein, the well-known Secretary of the German Automobile Club.

THE military interest in automobilism and the importance to the army of the new locomotion, are emphasised by one of the most successful dinners ever provided by the auxiliary forces, which was given by Colonel Mark Mayhew and the Motor Volunteer Corps at the Trocadero on Tuesday. The guests of the evening were Field-Marshal Earl Roberts, Lieut.-General Sir John French, and a number of leading military men. The guests being soldiers, there was little speech making, and what there was, was short and to the purpose, Lord Roberts being the principal speaker. He gave an amusing description of the first attempt to use a traction engine some thirty years ago in the Army Service Department. This vehicle

was employed for bringing up to the front—beer. But the intoxicating nature of its cargo seemed to influence its behaviour, for after having clambered up a steep hill, it rushed madly down the slope on the other side and flung itself recklessly into a deep ditch at the bottom.

In South Africa, Lord Roberts said that motors had proved of great use, and he well remembered one instance in which a 4.7 gun had been hauled up into position where it was urgently needed—a feat which would have been impossible without mechanical traction. The Commander-in-Chief also paid a tribute to the excellent service rendered by the motor cars at the manoeuvres of the last two years.

THE MOTOR UNION. LEGAL AND LEGISLATIVE DEFENCE FUND.

THE following letter has been addressed by Colonel Holden, Chairman of the Motor Union, to members of the Motor Union and automobilists generally. It is hoped that there will be a liberal response thereto :—

SIR,—As you are not only the user of a motor car but also, I believe, deeply interested in the automobile movement, I have been requested to seek your assistance in connection with the administration of the laws and regulations affecting these vehicles.

It is of the greatest importance to the movement that these shall be authoritatively interpreted and justly enforced. The Motor Union has spent considerable sums of money in striving to secure this result, but unfortunately the funds at its disposal have proved inadequate to the demands upon them. The Union is in consequence unable to take up all those cases in which its assistance would be of considerable service.

The legal and administrative expenditure of the Union may be said to group itself under the following headings :—

1. Settling important points of general principle by taking test cases to the High Court.

2. Opposing (a) Applications to close roads which are suitable for motor car traffic; (b) Unreasonable applications for a 10-mile limit of speed; and (c) Other proposals of public authorities unfairly restrictive of automobilism.

3. Assisting, under special circumstances, members summoned under the provisions of the Motor Car Act.

4. Assisting members in appeals to Quarter Sessions.

For all these purposes the Union finds that it is necessary to have a larger sum at its disposal than is secured by the ordinary subscriptions and capitation fees. Acting, therefore, upon suggestions made earlier in the year by Lord Onslow and others, it has been decided to establish a special fund, to be called "The Legal and Legislative Defence Fund," for the purpose of meeting this necessary expenditure.

In asking for the liberal support both of individuals and organisations towards this fund, it is unnecessary to urge the importance of this department of the Union's work.

A great deal of good work has already been accomplished by the Union out of its ordinary sources of revenue. Over £1,100 has been expended during 1904 to protect the rights and extend the privileges of automobilists.

Among the results obtained may be mentioned :—

1. A favourable decision of the High Court upon a point of law of great importance, the result of which is that motorists are no longer charged with the four offences mentioned in Section 1 of the Motor Car Act in one summons, so that the possibilities of an unfair conviction are correspondingly reduced.

2. A number of appeals to Quarter Sessions have been successfully assisted, and the system of timing employed by the police in several districts discredited.

3. Effective opposition has been given to the applications in various parts of the country of local authorities for regulations for a 10-mile limit of speed over large areas.

With reference to the appeals to Quarter Sessions, the cost of even a successful appeal varies from £60 to over £200. Such heavy charges practically prohibit men of moderate means from taking their cases, even when unjustly convicted, to appeal unless assisted. It is therefore only through the Union, by the aid of such a fund as this, that automobilists can fight unjust convictions.

Judicious expenditure of money is also necessary to pave the way for securing those amendments in the Act of 1903 which experience has already proved to be desirable. In asking, therefore, for liberal contributions to this fund, the Motor Union feel that they are inviting automobilists to aid in the most useful manner the automobile movement. You are therefore invited to fill up the enclosed form, and return it to me at your earliest convenience.

I am, Sir, your obedient servant,

(Signed) H. C. L. HOLDEN,
Chairman.

The following contributions to the Defence Fund have already been received :—

	£	s.	d.		£	s.	d.
The Earl of Onslow	10	0	0	Ballin Hinde	5	5	0
L. Schlenheim	10	0	0	C. L. Schwind	5	0	0
G. Stuart Ogilvie	10	0	0	Hon. J. M. Rolls	5	0	0
Dr. Acworth	5	5	0	G. Higginbotham	5	0	0
Claude Watney	5	5	0	R. W. A. Brewer	3	3	0
C. Jarrott and W. M. Letts	5	5	0	A. R. Atkey	2	2	0
Hon. C. S. Rolls	5	5	0	C. Wisdom Hely	1	0	0
G. T. Langridge	5	5	0	S. J. Housley	1	1	0
W. J. Leonard	5	5	0	A. A. Dale	3	3	0
J. R. Nisbet	5	5	0	H. A. Cunis	1	1	0
				W. Birtwistle	5	5	0

AERONAUTICS.

M. SANTOS DUMONT has come out in a new rôle. For some time he has, as our readers will remember, been threatening to experiment in quite a different direction from that which he had previously adopted. In fact, he was desirous of seeing how far he could solve the problem of what may be called vertical stability, in other words to construct a balloon that can be brought to any desired height in the atmosphere without throwing out ballast or letting out gas. His first attempts in this direction consisted in providing an ordinary spherical balloon with a propeller designed to lift it or pull it down. He is now making use of an even simpler principle. A spherical balloon has been constructed containing, like his airship, an internal ballonette. This internal ballonette is fed with hot air supplied by a couple of specially constructed petrol burners. If the aeronaut desires to rise he fills up his ballonette with hot air, and up he goes. If he desires to descend he lets out the hot air and turns down or extinguishes the burner. As there is no loss of gas from the balloon itself, he ought in this way to be able to keep afloat for an almost indefinite period. M. Santos Dumont's belief is that, if a spherical balloon could keep aloft sufficiently long it could sooner or later find currents in the atmosphere at one height or another to take it almost wherever its owner desires to go. Experiments have been already carried out in the Aero Club Park at St. Cloud, and short ascents have been made to test the apparatus.

A VERY similar principle was to have been adopted by M. J. Faure, who successfully travelled on Saturday night last from the Crystal Palace to the suburbs of Paris. He intended to use a 7-h.p. motor with two propellers for the purpose of regulating the height of the balloon in the air, on the Santos-Dumont principle, without wasting ballast. But the Customs officials intervened, and when the balloon arrived at Calais, for its journey across by boat, they refused to allow him to take the propellers out of the country unless he paid an exorbitant duty. So he left them behind with the motor. Even had the Customs officials been less unreasonable, the trip could hardly have been more successful. It is the first time on record on which a balloon has journeyed from London to Paris without a hitch, although the Channel has been many times crossed. The exploit, too, was done in record time, something less than six hours being occupied on the journey, which is more than an hour quicker than the most rapid express service.

A NEW machine, apparently of the aeroplane type, devised by a Mons. H. Gardet, was given a trial recently at Lyons. It was started from an eminence 120 feet from the ground, and, as was to be expected, after flying a few feet it made a sudden dive downwards. The plucky inventor fortunately escaped (by a miracle) with nothing worse than a broken leg.

RACES, RECORDS, AND TRIALS.



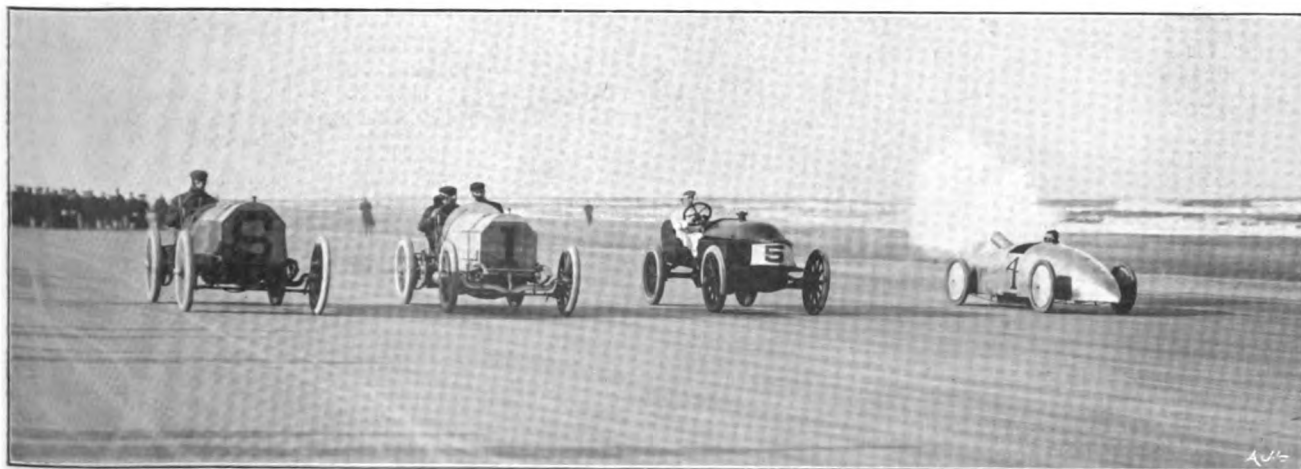
ORMOND-DAYTONA BEACH MEETING.—William Fletcher, on the Darracq Car, who won the 100 Miles Race in the record time of 78 mins. 24 secs.

Ormond-Daytona Race Meeting.—Additional photographs are to hand this week of this very important race meeting, a few of which we are able to reproduce. The record times which were lowered will probably make this beach gathering an historical one for some considerable time.

The Gordon-Bennett Race and Grand Prix.—The Minister of the Interior, M. Etienne, announced at a Cabinet Council held on Friday in last week, that he had decided to authorise the holding of the Gordon-Bennett Cup Race over the Auvergne Circuit, subject to the measures for preventing accidents adopted by the organisers of the race meeting with his approval. It will be observed that the official permission refers to the Gordon-Bennett Race only, no mention having been made of the Grand Prix, and it is not inconceivable that running the two races together may not strike the Minister as likely to minimise the chances of accidents.

As regards the position taken up by all the European automobile clubs, that remains apparently unaltered, and the meeting of the Gordon-Bennett Commission, which, as we mentioned last week, has been summoned at the instance of the other clubs, will, it is now announced, be held on the 20th of the present month.

Some of the French manufacturers, through the Chambre Syndicale, have attempted to counter the move of the foreign clubs by declaring that *unless* the Grand Prix and the Gordon-Bennett *are* amalgamated they will not enter, and this resolution has been subscribed by such important firms as Messrs. Clement Bayard, Renault Frères, De Dietrich, Mors, and Darracq. Between the foreign clubs who refuse to have anything to do with the race if the Grand Prix and the Gordon-Bennett are amalgamated, and the French manufacturers who refuse to have anything to do with the latter event unless the amalgamation is insisted upon, the position of the A.C.F. is a somewhat embarrassing one.



ORMOND-DAYTONA BEACH MEETING.—Flying start for the final for the Dewar Trophy. The Cars and drivers are, reading from left to right, E. R. Thomas' 90-h.p. Mercedes (No. 6), W. K. Vanderbilt's 90-h.p. Mercedes (No. 1), A. MacDonald's 6-cylinder Napier (No. 5), and Louis Ross' steam vehicle (No. 4). The race resulted as follows:—Ross (1), MacDonald (2), Vanderbilt (3), E. R. Thomas (4).



ORMOND-DAYTONA BEACH MEETING.—The Duke of Manchester and his little son on the Beach.

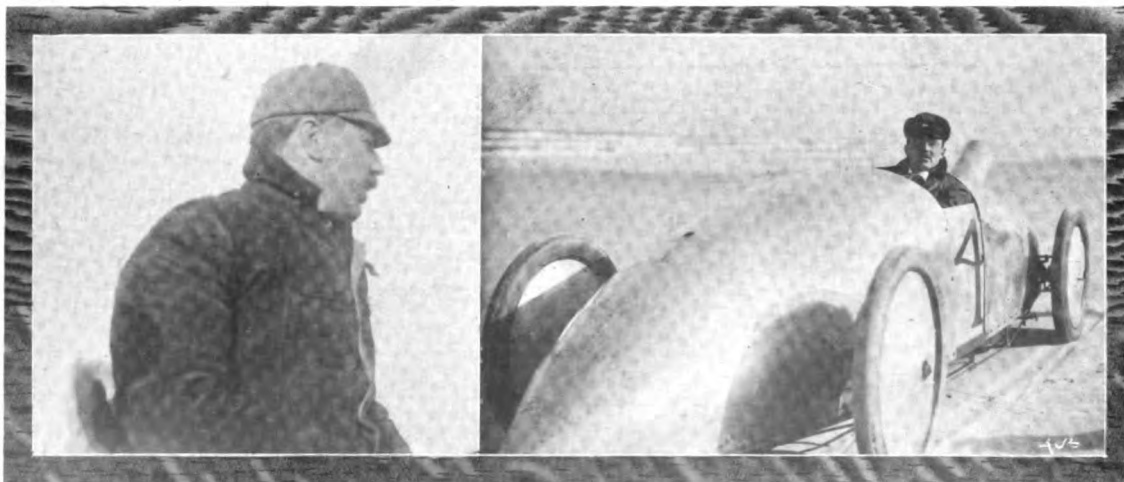
A RACE meeting is to be arranged by the A.C. of Salon during the coming season, when there will be separate races and classes for speed trials over the kilometre, 5 kiloms., and 10 kiloms. on the famous Salon-Arles Road.

5,000-Mile Trial—The Official Report.—The long-distance trial of the 12-h.p. Siddeley car, which has been fully reported week by week in the pages of this Journal, came to an end, it will be remembered, on Wednesday of last week. The A.C.G.B.I. certificate of the performance is now to hand, and shows the highly satisfactory nature of the trial. The trial lasted for 33 days, of which only three were fine; the total petrol consumed was 309.5 gals., and the water 17.6 gals.; the average daily mileage was 151.5, and the average mileage per gallon of petrol and water 16.1 and 28.4 respectively.

Referring to the condition of the car after the trial the official report states that "the whole of the mechanism was found to be in a remarkably good condition; the change-speed-gear and differential showed no signs of wear whatever. No bearings were found to be materially worn, and no parts required renewal. . . . What was first reported as a crack in the water jacket was found on dismantling to be merely leakage at the core-hole plug."

2,000 Mile Trial—The Official Report.—The trial of the Straker-Squire Public Service vehicle fitted with a trial body came to an end on February 3rd last, and the official report of the A.C.G.B.I. is now to hand. The results of each daily run have already appeared week by week in this Journal, but the following summary of the performance is of additional interest. The trial lasted twenty days, of which only four were fine. The consumption of petrol was 298 gals., and of water 11.9 gals. The daily mileage was 100, and the mileage and ton mileage per gallon of petrol 6.71 and 33.5 respectively. The mileage per gallon of water was 168.

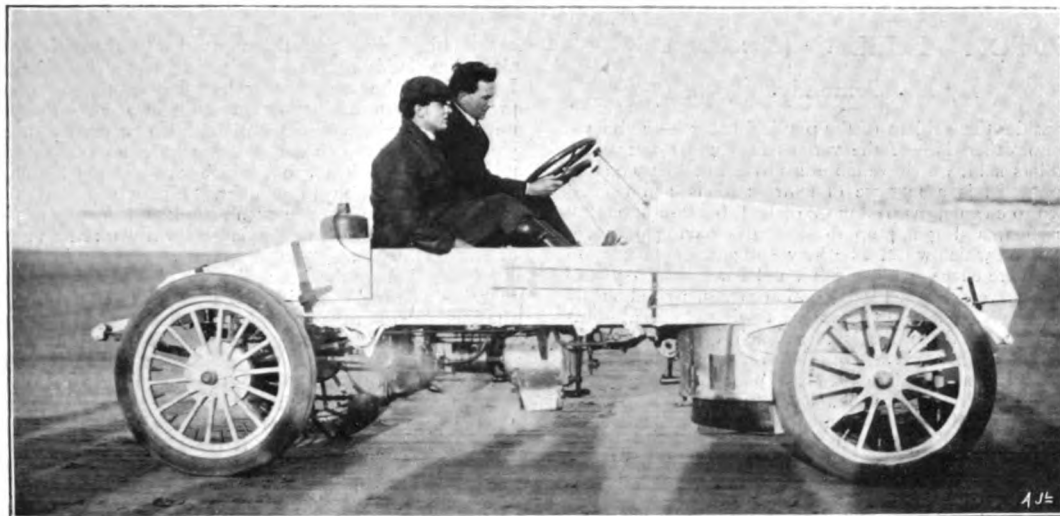
Referring to the condition after the trial, it is remarked in the report the two sets of gear "were found to be in fair condition considering the distance travelled, but the edges of the teeth of two of the change-speed wheels were somewhat worn and it was found that the bush at the centre of the spur-wheel of the differential-gear required renewal and the bevel pinions on the near and short end of the sprocket shaft required refixing. The



H. L. Bowden, who has accomplished the quickest time in the world for a mile, viz., 32½ secs. His Mercedes Car, however, being considerably over the recognised weight it is doubtful whether the time will be accepted as a record.

Louis S. Ross in his freak Stanley Steamer.

ORMOND-DAYTONA BEACH MEETING.



ORMOND-DAYTONA BEACH MEETING.—Webb Jay on the White Racing Steamer.

sprocket-wheels and pinions were found to be in a remarkably good condition.

"The front wheel tyres were in fairly good condition, but that of the off-side wheel had one large cut. The tyres of the driving-wheels were worn with fair uniformity, but the outside near tyre was split throughout a considerable part of the circumference."

ANNOUNCEMENTS are being made that the Blackpool Corporation propose holding a three days' meeting for motor cars, one day being devoted to motor boat races in July next, when the opening of the new promenade is to be celebrated. We do not remember having seen this fixture, however, in the list of dates so far authorised by the Automobile Club, and as the Brighton meeting is already definitely fixed, we hardly think the club authorities will care to sanction a second meeting of the same magnitude during the same month.

ACCORDING to a lay contemporary, the Nice Automobile Club have intimated that in consequence of the urgent desire of French manufacturers to prepare for the Gordon-Bennett and Grand Prix Races, the proposed speed trials at Nice have been abandoned. We await further developments with some curiosity.

THE municipality of Munich has added a prize of the value of 1,000 marks to be run for in connection with the Herkomer Cup Race.

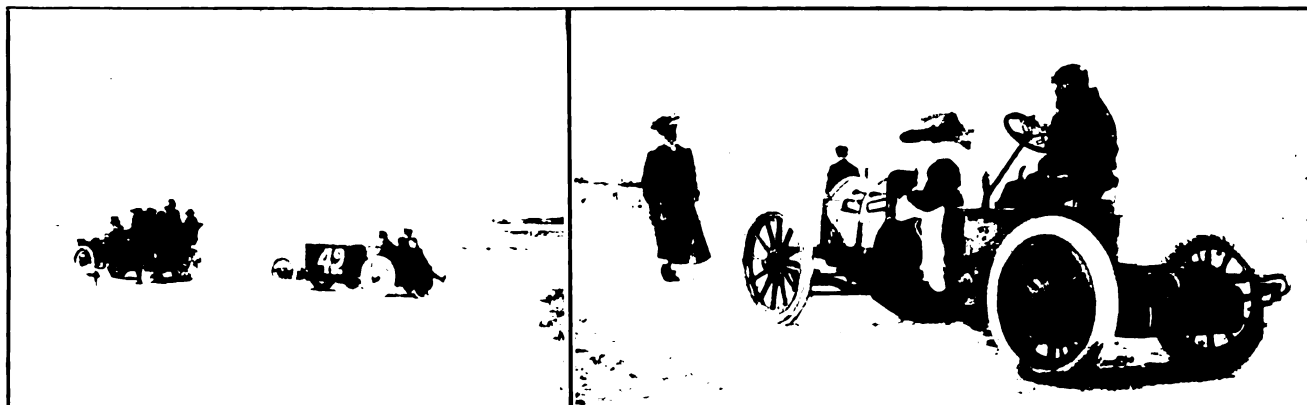
In connection with the Agricultural Competitions held at Bordeaux, under the direction of the French Minister of Agriculture, it has been determined to include automobile vehicles and tractors as applied to agricultural requirements. The Exhibition takes place from May 27th to June 4th.



MOTOR BOATING.

Motor Boat Record.—At the Havannah meeting for boats, which was held last week, Mr. Brokaw's "Challenger" boat, driven by Mr. Proctor Smith, is reported to have made the record time of a mile in 2 mins. 2 secs.

Two of the Napier racing motor boats are to take part in the Alexander-Burton Cup Race on April 20th.



Barney Oldfield's "Green Dragon" being towed into position for starting.

James L. Breeze takes his daughters for a spin on his big Mercedes Racer.

ORMOND-DAYTONA BEACH MEETING.

MOTOR FUELS.* (Continued).

By Dr. Ormondy.

Now let us consider the subject of the physical nature—the homogeneous nature or otherwise—of the various fuels under discussion. Ordinary petrol as sold, which we motorists have to take up on the road as we can get it, is a mixture of hydro-carbons commencing with one known to chemists as pentane, so called, because of having 5 atoms of carbon, and going up to molecules having 9 or 10. This is a description which will not be very enlightening except to those of you who are educated chemically, and I would refer you to the boiling-point curves, so called fractionation curves, carried out by Mr. Lester, of the Chamber of Commerce Testing House at Manchester, and printed in the first paper which I gave before the Automobile Club for other evidence of this variation in composition. If you start to heat up a liquid like water, and put a thermometer into it, and notice the temperature at which it begins to boil, you will find that it begins to boil, for instance, at 100 degrees Centigrade, and that it will go on boiling at 100 degrees Centigrade till it is all gone. That is because water is a homogeneous substance. If we take a mixture such as petrol, we shall find that it begins to boil at about 80 degs. Centigrade, and then the thermometer goes on rising until practically the whole of the liquid is gone over, when the temperature may be as high as 222, which is an actual temperature recorded by Mr. Lester on a sample of petrol. This means that petrol consists of a mixture of organic compounds, some of which boil at 80 and others at over 220 degs. Centigrade. Obviously, a fuel made of a mixture of things like this is a long way removed from being an ideal fuel. It is the case that pure benzol, or benzene, boils at somewhere about 80 degs. Centigrade, but crude benzene, such as we have to use owing to the restrictions of supply and price, boils at anything from 80 to 200 degs. In other words, its range of boiling point is about the same as petrol. Now alcohol is a chemically homogeneous substance, like water it starts to boil at a certain temperature, and it finishes boiling at the same temperature, about 80 degs. Centigrade.

We come now to vapour tension, and this is perhaps not so easily treated. A high vapour tension means that the substance volatilises easily, and we want that. On the other hand, it means a substance which is liable to catch fire. Alcohol has a very much lower tension than either benzene or petrol, and it is not so easy to start a motor with it. On the other hand, if we can arrange a carburettor which will work efficiently with alcohol, we are far better off, because we have got a substance which always has one vapour pressure. It does not want x per cent. of air to burn at one time and 1·7 x per cent. at another time. The whole thing turns on the possibility of obtaining a carburettor which will convert alcohol into a vapour in such a way that we can start with it. It is generally stated that it is impossible to get a carburettor which will fulfil these requirements, but I should attribute that not to the fact that it is impossible to make such a carburettor, but to the fact that up till now very few people have worked in this direction. That it is not impossible I know, because in conjunction with the Belsize Motor Company at Clayton, we have there made a carburettor which on quite a number of occasions has started cold with alcohol as a fuel.

So far we have seen that, as regards heat contents, alcohol is deficient; as regards efficiency it is far and away ahead of its competitors; regarding range of explosion it is also far and away to the front, and the combustion is far completer. As a matter of fact, the only cars I know running with alcohol pure and simple, or with such a small amount of benzol that it hardly counts, are the Government vehicles, the Post Office vans, the War Office vans, and the like, run in Berlin and in Germany generally by the Government there. These run on alcohol containing 10 per cent. of water and about 2½ per cent. of benzol, and I think it is an absolute impossibility at a distance of three yards behind one of these cars to distinguish the slightest smell. So far then, alcohol distinctly deserves the precedence as most nearly fulfilling what we have expressed as being the requirements of an ideal fuel.

There is one other point I wish to touch upon, and that is that the efficiency of the heat engine depends to a large extent on the compression at which an engine can be run. It is generally stated in text books that petrol cannot be used in an engine which has a compression of more than about 5 atmospheres. That is 75 lbs. to the square inch. Ignoring the fact that I already have a special design of petrol engine running at 10 atmospheres without pre-ignition, it means that petrol cannot possibly give anything like an ideal efficiency. Now you cannot run an alcohol engine efficiently unless you give it 10 atmospheres compression, and it will run better if you give it 15. In so far that an engine running at a high

compression gives you the most nearly theoretical results, the alcohol engine is much more suitable than the petrol engine. When I said that I knew of a petrol engine running at this high compression, I must say that it was built in a special way. You will not get pre-ignition with petrol with 10 or even 15 atmospheres if your cylinder is a polished one, you have no carbon deposited and no sharp points sticking out which can get red hot and remain so from one explosion to another. I may say that for practical purposes a petrol engine won't work above 5 atmospheres compression, but with alcohol an engine will work at a very high grade of economy at 10 and 15 atmospheres.

We are led to the conclusion that in many respects alcohol is a more suitable fuel than either of the others, and we now come to the final criterion, that of cost. What I should like to point out is that one prime requirement of a motor fuel at present is that it shall be obtainable everywhere. Let us look at the question from an economical standpoint. We have got an industry which is growing rapidly, and which I think many of us believe is going to be one of the great staple industries of this, an engineering country. And the basis of the whole industry is that it shall always be possible to obtain motor fuel. The motor fuel which all our engines are built to consume is petrol. Now let us for a minute look into the sources of supply. We used to obtain petrol from America. That was what was known in this country as motor spirit, and was obtained from the American petroleum ring. After a time there was a sudden increase in the price of petrol, and at the same time it was accompanied by an equally great increase in its specific gravity. Instead of it being 0·68 it went up to 0·7 and 0·72. The price went up because only certain works in America were fitted for the economical production of the volatile proportion of petroleum known as petrol. The whole of the petroleum of America contains on an average two per cent., which on distillation we can collect, and which we call petrol, and the home requirements for petrol in America got to be so great that they had nothing to export. But you will say the 720 and the 700 spirit was sold in this country as motor spirit. Certainly, because the transport company were importing and distributing other petrol on behalf of the American ring. We were obtaining from Sumatra the spirit which was sold in this country under the name of motor spirit. The Sumatra oil fields give a considerably higher percentage of petrol than the American oil fields. I think something like five per cent. is obtained from the Sumatra material, but the fields are situated a long way from the coast, and the spirit had to be refined to a certain extent before the railway company would carry it. The pipe lines were not running from the oil fields down to the coast, but of late these pipe lines have been completed, and now the Sumatra spirit is sent down to the coast and shipped or distilled there. The spirit which we obtain from Sumatra is consequently considerably better in quality than it used to be, but still has a much higher boiling point and a much higher gravity. At the present moment we are obtaining material from America, but the greater quantity comes from Sumatra.

As to the requirements of the automobile industry in the immediate future, there is already talk of putting 1,500 'buses in London. I reckon that a 'bus runs 10 miles to a gallon, which I think is an outside limit, and that each 'bus runs 50 miles a day. That means five gallons a day, and at 300 days a year that amounts to 1,500 gallons per 'bus. When you begin to talk about 1,500 'buses in one city, and think about the tremendous growth in the use of pleasure vehicles, and about the large quantities that are used in 300 and 600-h.p. internal combustion engines in submarines, one sees that the market is an enormous one, and one which is growing rapidly. And the whole of that market is built upon what? The supply of a fuel which is in the hands of three syndicates—one Russian, one American, and one which is partially controlled in this country, and we have absolutely nothing to put in the place of it. On the Continent they are getting better petrol than we are, because they can simply say, "If we don't get it we will use alcohol and benzol mixed, which is just as good," and I think if an engine were built with the express intention of running with alcohol, and built to run on a high compression, and with a proper carburettor, we should find that alcohol, with two or three per cent. of benzol, would also be equally, if not more, efficient than the petrol engine.

In the case of fire petrol cannot be extinguished by water, for it floats on the top and continues burning. Alcohol is not only mixable with water, but it has an affinity for water, and if you reduce the percentage of alcohol below about 50 per cent. it will not burn. So far we have seen that there are strong arguments in favour of using alcohol, and that the automobile industry is at the present moment largely dependent on outsiders for its supply of petrol, and we have nothing to put in its place. I say that it would be a very simple thing, if we possessed a Government which devoted one-tenth the amount of trouble or care to the development of its internal industries, as, for instance, the German Government does,

* Abstract of a Paper read before the Scottish A.C. (Western Section), on January 30th, 1905.

to arrange that such fuel should be produced in this country or in the Colonies belonging to this country, at a price which would enable it to compete with petrol imported from foreign countries. There are 150 distillers in the British Isles. Of these, I think, six make methylated spirits. These six have every reason to say they must be consulted in any arrangements which are come to by the Government as regards making easier the laws with regard to the manufacture of alcohol for industrial purposes, but I fail to see how far the other distillers who have always been, and have never thought of being other than manufacturers of anything but potential whisky, have to do with the question. It is a well known fact that a plant could be put down for the manufacture of alcohol on a large scale from the cheapest possible material such as damaged grain, potatoes and the like, which could make alcohol at about 8d. or 9d. a gallon, which alcohol could be denatured the moment it is formed.

Suppose we motorists, and the illuminating and heating people, say we shall want about 10 million gallons next year, 20 million the next year, and 150 million after that, the British people would object to paying at the rate of 9d. per gallon for 150 million gallons, in order that an industry may be able to keep in their hands a trade for which their plant is not fitted. I think it behoves all of us to protest in the Press and in every way against allowing the Government to pay a bonus to the distillers on alcohol, made under the antiquated conditions at present existing, for industrial purposes.



A VARIABLE MOTOR-CYCLE GEAR.*

(Continued).

ALTHOUGH the gear was free from the most serious defects which are commonly found in such pieces of mechanism, it has given trouble in certain minor details, which are instructive as showing the kind of difficulties which are likely to arise in practice. (a) There was no provision for taking up the wear of the leather band-brake on the sun. This has been remedied in a later pattern. (b) The whole pull of the engine on the band was supported by a weak little catch on the ratchet lever, which was always breaking. (c) There was no provision for adjusting the engine-chain without either shifting the engine on the frame, or shifting the position of the gear-bracket. Both of these operations were troublesome to perform, and involved a number of awkward subsidiary adjustments of other chains and levers. (d) The sun pinion had a plain bearing, which was excessively exposed to mud and dirt, and required oiling every fifty miles, as there was no provision for retaining the oil. (e) There was an oil hole near the edge of the ring for oiling the free-wheel and the plain bearing between the ring and the planets, which had the effect of draining the oil out of the gear by centrifugal force. (f) There was no provision for getting oil into the central box containing the gear pinions. (g) The gear-box was held together with six screws, which were subject to racking strains, and had to be riveted up at the ends to prevent them working loose. It was a very difficult matter to get the gear apart when necessary without special tools. (h) It was impossible to replace a broken ball in the inner ball-race, or a broken roller or spring in the free-wheel, without taking the whole gear to pieces.

To increase the range of the gear, Messrs. Garrard suggested to me that I should fit a second two-speed gear of the same kind in place of the countershaft on the chain-stays. This was quite impossible owing to exigencies of space and chain lines. The only space available was in the middle of the diamond frame above the bottom bracket. Fitting a second gear in this position involved increasing the number of motor chains to four; but, on the other hand, the gear would be higher up and less exposed to dirt, the chain-lines could be accommodated accurately, and each chain could be made separately and independently adjustable by arranging the chain-stays nearly at right angles to each other. It also appeared that it would be possible to secure in one mechanism certain subsidiary advantages, namely (1) pedal control of the gear (2) a variable pedal gear, and (3) a free engine gear. The gear thus fitted will be called the "back-gear," the gear originally fitted to the machine being called the "forward gear."

To secure pedal control of the gear, the sun pinion was mounted on a ball-bearing hub, with a back-peddalling brake connected by chain to the pedal-sprocket in place of the leather band-brake. A slight backward pressure on the pedals reduced the sun to rest by friction, thus raising the gear. The sun bearing was protected by an oil-retaining hub, and the troublesome adjustment of the leather band was avoided, curing troubles (a), (b), and (d). In addition to this, the gear could be still further raised by pedalling backwards, which caused the sun to rotate backwards and to drive the ring forwards relatively to the planets. At a later stage the sun pinion of the first gear was also fitted with a similar back-peddalling brake,

so that both gears could be raised by the action of the pedals. It was found to be a great advantage to be independent of the leather band-brake, and to be able to change the gear up or down by an almost imperceptible movement of the pedals. The particular type of back-peddalling brake adopted was the Garrard "Moderatum," which possesses special advantages for the purpose.

If a 70-in. gear with 7-in. cranks is suitable for starting and driving an ordinary pedal cycle with a total load of say 200 lbs., it is plain that a gear at least as low as 26 ins. should be required for starting a forecar with a total load of 600 lbs. But this gear would be much too low for assisting the engine at any speed, so that a variable pedal gear is evidently required if the pedals are to be effectively utilised. To obtain this advantage without fitting a separate variable-pedal-gear, it was arranged that the chain for working the back-peddalling brake on the sun pinion should also drive the planets forward by means of a free-wheel clutch. This gave a variable pedal gear with a ratio of 4—3, operating by the same epicyclic mechanism as the engine gear; and the ordinary pedal chain direct to the back wheel could be discarded.

A free engine gear was secured in addition to the above modifications by simply omitting the rollers from the free-wheel clutch between the planets and the ring, which was now no longer required. In the clutch there is a slip-ring between the rollers and the friction disc fixed to the sun pinion. If this slip-ring is held stationary by means of a pawl, the rollers cannot engage, and the sun pinion can run forward freely, permitting the planets to revolve without driving the ring. A backward pressure on the pedals reduces the sun to rest gradually by friction, thus driving the ring and starting the machine as smoothly as desired. The subsidiary advantages of this arrangement were: (1) The force required to control the sun-pinion was only one-third of the whole drive, so that a very small metal-to-metal clutch sufficed. (2) The pedals were utilised to operate the clutch as well as the change gear. (3) The pedal crank made an ideal starting handle. (4) By pedalling against the engine compression, the machine could be manoeuvred forwards or backwards on a very low pedal gear, thus providing two additional pedal gears, which were useful in traffic, or in turning the machine in a narrow road without dismounting, but could not be used for starting.

The arrangement of gear above described was a great improvement in many respects, but the range (16—9 for the engine and 4—3 for the pedals) proved still insufficient for adverse conditions. An extra low pedal gear for starting, combined with an additional engine gear, was obtained in a comparatively simple manner by means of the old pedal chain. The free-wheel clutch driving the planets from the pedals was replaced by a "moderatum" with a slip ring, which could be held by means of a pawl, so as to put the clutch out of action when desired. There were thus two "moderatum" on the hub, fixed to the sun pinion, one, A, clutching the sun to the pedals, the other, B, clutching the sun to the planets. The following four changes were thus obtained with two clutches (see Fig. 3):— (1) High gear or back-peddalling gear, A, clutched to pedals. (2) Normal gear, A, free; B, clutched to planets. (3) Pedal gear, B, free; A, clutched to pedals. In this case the sun could overrun the planets, but not the pedals. The engine gear was lowered in the ratio of 5 to 4, and the pedal gear simultaneously in the ratio of nearly 2 to 1, part of the engine power being transmitted through the pedal chain. (4) Free engine gear, both A and B free, so that the sun could run free forward, but could be held by a light back pressure on the pedals. Besides these four changes of gear, the leather band on the forward gear gave an additional change in the ratio of 4 to 3, which could be used in any combination with the four changes given by the back-gear.

The combination above described gave a range of engine gear in the ratio of 9 to 20, and of pedal gear from 50 ins. to 26 ins., in addition to a free wheel and a free engine gear, without including the back-peddalling-gear, which was equivalent to a higher engine gear. On the low gear the engine could take a load of 560 lbs. up a gradient of 1 in 9 without pedalling, or 1 in 6, if not too long, with pedal assistance. The quickest and easiest method of starting was by the pedals on the low gear, running up the gamut of the gears as the machine gathered speed.

With a light machine and a low pedal gear for starting, the free engine gear was found to be of so little use in practice, and the fan cooling was found to be so efficient, even on the lowest gear at full throttle, that it was decided to fit an extra low engine gear in place of the free engine. This was effected by fitting a "moderatum" on a ball-bearing hub to the sun pinion of the forward gear, and connecting by chain to a fixed wheel on the sun hub of the back gear. When both A and B clutches were freed on the back gear, as for the free engine, the sun pinion on the back gear was free of the planets and pedals, but could not overrun the sun pinion on the forward gear. This gave a further step down in the ratio of 4 to 3, and made the engine equal to any emergency.

(To be continued.)

* Abstract of a paper, by Prof. Callendar, read before the members of the Auto Cycle Club, on Wednesday, February 8th, 1905.

CLUBS AND ASSOCIATIONS.

Hartlepool Automobile Club.—The annual general meeting of the club was held recently at the Grand Hotel, when a large number of automobilists were present. The balance sheet for the past year's work was presented, and showed a substantial balance in hand.

Two cups were presented to the committee—one for competition among the cars, given by C. E. Smith, Esq., C.E., and the other for motor cycles by Mr. Harold E. Pyman.

The following officers were appointed:—President, Mr. G. Jones, J.P.; vice-presidents, Drs. F. H. Morison and A. E. Morison and Mr. J. R. Fothergill; committee, Messrs. A. G. Rickinson, C. E. Smith, R. Lauder, jun., C. McAdams, and Dr. Wall; hon. treasurer, Mr. H. H. Barraclough; hon. secretary, Mr. C. C. Brown.

Nottinghamshire A.C.—A lecture before members of the club took place last week at the Black Boy Hotel, when the subject was "Motoring Experiences in South Africa," by Mr. A. R. Atkey. Amongst those present were the President (Mr. C. Hardy), Messrs. Wells-Lucas, S. Harvey, A. Watts, F. Pearson, J. C. Bennett, R. Harbridge, H. Bircumshaw, H. Kirk, Dr. Gass, E. A. Stevens, C. L. Stevens, H. V. Stevens, W. M. Hutchinson, A. Metheringham, B. Winter, G. Cowen, M. Ross-Browne, and W. D. Wells. Mr. Atkey said that during his various visits to South Africa he had travelled between 13,000 and 14,000 miles by sea and 4,000 by land. He had made motor trips through Cape Town, Bulawayo, Port Elizabeth, Ladysmith, Mafeking, and all the principal towns in Cape Colony and Rhodesia. Mr. Atkey said the roads were almost impassable in certain parts of the country, and he gave many original slides showing the stiff gradients, frequently averaging 1 in 6, which South African automobilists had to overcome. The difficulties of crossing the veldt and negotiating the water sprouts and other natural objects encountered out there were humorously described and vividly illustrated. At one place they overtook Sir Hely Hutchinson, the then Governor of Cape Colony, making a tour of the different towns. Entering one place about two hours before the Governor was due, Mr. Atkey and a friend found it lavishly decorated, with the local band and all the population lining the streets. As the 12-h.p. Gladiator ran along the two occupants were greeted with acclamation by the whole populace under the impression they were the representatives of the Government! "As a member of the Notts Automobile Club I did my best to uphold its dignity under the exceptional circumstances," said the lecturer. Mr. Atkey was the first to accomplish the journey between Johannesburg and Mafeking, a distance of, roughly speaking, 200 miles, in one day. To do that he was driving a car fourteen hours continuously. His was only the third car to enter the famous siege town. "We left Johannesburg," said Mr. Atkey, "twelve hours later and arrived at Mafeking thirty-six hours earlier than the train," which is, of

course, explained by the fact that he followed a cross-country route direct to his destination, whilst the train made a detour of about 1,000 miles. Amongst other interesting places visited by Mr. Atkey were Kimberley, Bulawayo, Salisbury, Aden, and the grave of Mr. Rhodes at World's View.

Automobile and Cycle Engineers' Institute.—The next meeting of this Institute will be held in Birmingham at the Grand Hotel, on the 21st inst., when Mr. Dugald Clerk will read a paper on the testing of petrol engines. Mr. H. Austin will take the chair.

Society of Automobile Mechanic Drivers.—The Second general meeting of this recently-formed society, was held at the headquarters, 51, Brooke Street, Piccadilly, during the early days of this month. Between sixty and seventy were present, including Messrs. Sidney Girling, Wood, Budd, Groves, and Ebel, Mr. Arthur R. Ivens, the secretary, being in attendance, and very busy by reason of the numerous applications for membership. Mr. Woods, the president, was in the chair, and pointed out that the proposed rules were now in course of being got ready. Under these, provision was made for an employment bureau, those making use of it being required to have three years' technical and practical experience before being eligible for membership. A very important rule is the exclusion of aliens from membership. The society are endeavouring to grasp the very difficult subject of ensuring responsible and competent drivers being available for employers, and they propose that only capable practical men should be eligible to join. They hope to remedy the state of affairs in regard to incompetent drivers by guaranteeing that all their members shall be first-class, thorough workmen, willing and able to do their level best in their employers' interests. The society is not in any shape or form a trade union, the question of wages being simply one between master and man. It is formed rather as a friendly self-help society, so that one owner may recommend a member of this society to another owner in the full confidence that he will be recommending a good man. The main object of the society will, therefore, be to bring forward the good men and eliminate the bad, its work being as much in the interests of employers as employees. Examination of proposed members will be held every Monday evening by the committee. A number of questions will have to be answered in writing, in addition to which they will be asked to answer verbal questions, no two candidates necessarily being asked the same question. These questions would mainly refer to repairs, &c., such as occur in actual experience. Under Rule 10 the society take power as follows:—"Any member of this society proved dishonest to the satisfaction of the committee may be expelled the society."

We wish this new institution every success and hope to hear of its working satisfactorily in the near future.



Suspension of Habeas Corpus?—Some little time ago Mr. G. Read, of Market Harborough, was fined 12s. for riding a bicycle without a light. He presented himself at the Police Court with only about 9s. in his pocket—the usual fine it will be remembered being 5s. for this offence. However he was ordered to pay 12s., and while waiting for the balance to be sent him he was removed to gaol, handcuffed to a man who was sentenced to 14 days' hard labour for embezzlement, and was further charged 4s. 6d. by the police for the cab to the gaol—a distance of about half a mile. On arrival at the gaol he was treated in all respects as a felon. The matter is being now brought before the notice of the Home Office by the National Cyclists' Union, and we hope some satisfaction will be accorded to the unfortunate victim of police brutality. His treatment, at any rate, could hardly have been worse had he been a subject of the Czar of Russia. Had he not presented himself at Court at all the fine would probably have been collected by a policeman at his residence.

THE "unco' guid" of Hastings are still going at the Sunday motor omnibus service with all the fury characteristic of

"Doctors of theology when they
Dispute with sceptics."

At a meeting recently held to protest against the service, the sad case of a gentleman was brought forward who had intended to take a house in Hastings, and when he learned that the place was so abandoned as to permit the running of 'buses on Sundays refused to hire the house. One is disposed to recommend the "unco' guid" of Hastings, instead of worrying themselves over a 'bus service which is a source of innocent enjoyment to a great many harmless people, to concentrate their attention on some of the Sunday afternoon proceedings that take place in the immediate neighbourhood of the town. But as Macaulay said, the Puritans objected to bull-baiting, not because it hurt the bull, but because it gave pleasure to the spectators.



Mr. Edge, who is fertile in expedients, wished just before the Olympia Exhibition to provide a practical object lesson with the various types of motor cars which the Napier Company turn out. He accordingly organised a press run to Brighton and back, the excursionists being carried by samples of all the different types of Napier cars that are being supplied this season. The photograph reproduced shows the cars assembled at Waterloo Place.

NIAGARA, at Westminster, has been acquired by the Wolseley Tool and Motor Car Company to serve as an up-to-date garage, and the Company's London offices.

THE King, in returning by motor car last week from Mentmore, after his visit to the Earl of Rosebery, started at half-past three for London, and arrived at Buckingham Palace before dusk.

OUR contemporary *l'Auto* heads a short article on recent Italian automobile tours of the Queen Mother Margherita with the appropriate title of "Une Reine Moderne." It is a good title. Queen Margherita has always been in the best sense of the word, a modern Queen, and it is probably her progressive spirit, combined with a singular charm of manner, which has so specially endeared her to the Italian people. It is appropriate therefore that she should be the special patron of automobilism in the classic peninsula.

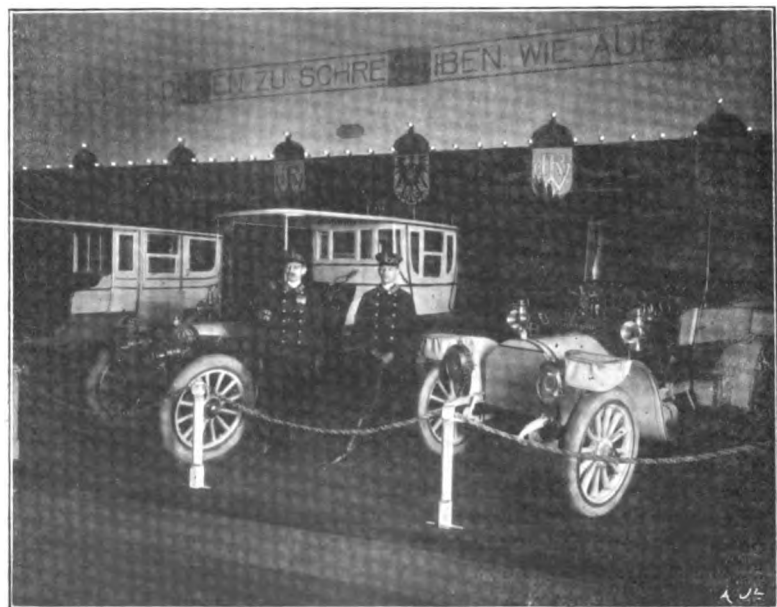
As most people are aware, the Hanwell-Uxbridge road has been for a considerable length of time a source of great annoyance and complaint to all motorists and cyclists who have been compelled for their sins to make use of it, the narrowness of certain portions of the road being a source of very great danger. The Roads Improvement Association, which seldom neglects an opportunity of benefiting road users, has communicated with the Highway Committee of the Middlesex County Council, with the result that the Council has decided to widen the road between Southall and Uxbridge pending the adoption of a larger scheme for the general improvement of the road. It is not the first occasion on which the Middlesex County Council has shown itself to be an enlightened and progressive body.

A PUBLIC motor service has been experimentally run for the past two months

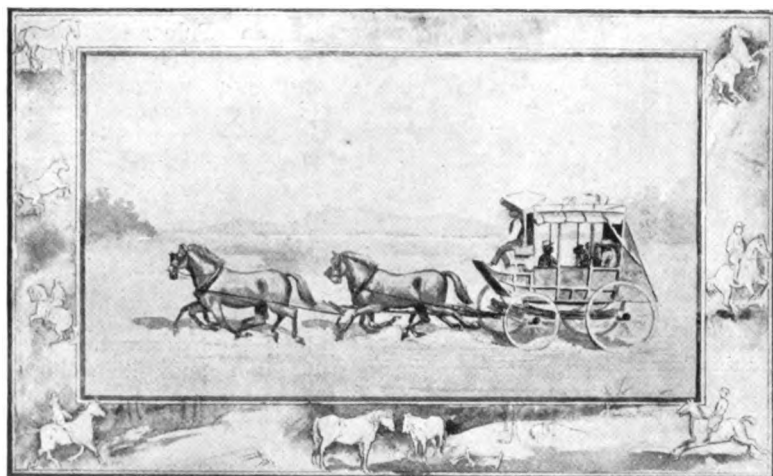
between Pulborough and Worthing. The company who are responsible for this have found it so successful, that they now propose to extend it from Worthing through Lancing and Shoreham to Brighton. A charge of not more than 2d. per mile will be made, and it is hoped that the latter distance will be run along the sea front. The Brighton authorities, however, so far have refused to grant the necessary license.

At the recent conference of the municipal tramway authorities held at Westminster Palace Hotel, it was decided to oppose the proposals of several railway companies for bringing in private bills this Session, to run lines of motor omnibuses, unless these services were to be confined to railway stations and points in the neighbourhood. It is evident that the tramway interest is determined to fight the motor 'bus almost before the motor 'bus has become an established institution.

WE note with pleasure that the Hove Town Council have made provision for vehicles being properly lighted at night, with the extra condition that vehicles carrying timber or loads projecting more than 6 ft. to the rear must show a red light visible to persons overtaking them.



The interest taken by H.I.M. the German Emperor in the automobile movement is well known, and a very effective stall, at the Berlin Automobile Exhibition is stocked entirely with the Emperor's own cars which he has lent for the occasion. The view of the Emperor's exhibit which we reproduce above enables a good idea to be obtained of the variety of vehicles which form His Majesty's stud.



Probably one of the biggest markets in the future for automobiles will be Australia. Already a number of both pleasure cars and commercial vehicles are doing duty in the Commonwealth. The vastness of the country, however, is such that in numerous directions there are huge tracts which are as yet untouched, or even approached by the railway. The old-fashioned mail coach is still a familiar object, therefore, in many inland parts of Australia. The Australian "Coachbuilder" gives in its Christmas number the above interesting picture, issued as a coloured plate. The subject, although strange to the town dwellers, is still a familiar everyday scene in outlying districts of the country.

THE Russian Government has discovered the United Motor Industries' "Collan" oil, and they have ascertained that it is particularly valuable for making leather proof against both water and weather. The Russian authorities have accordingly been enquiring as to where they can get a supply for use in Manchuria.

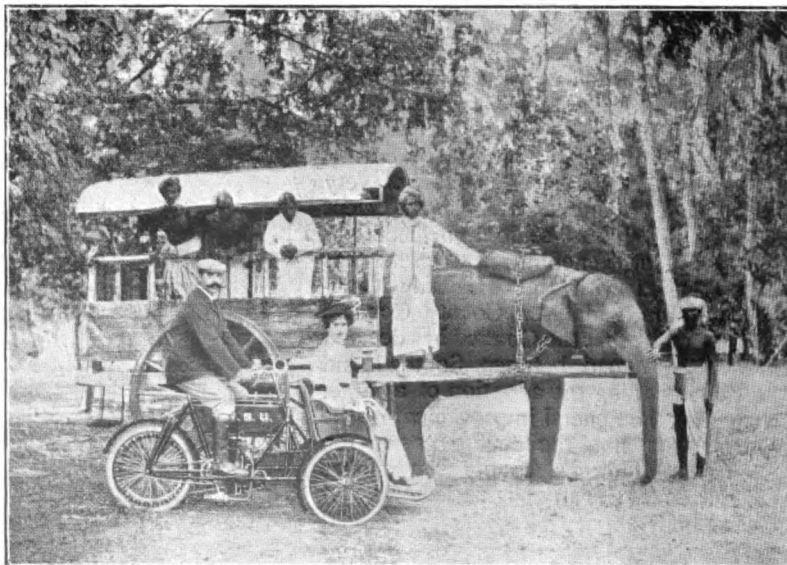
WE have more than once had occasion to differ from the Lord Chief Justice in the decisions he has given in motor car cases when sitting in the Divisional Court. It is, therefore, an all the more agreeable surprise to find his Lordship in a recent case stating that "motor cars have to a great extent become an absolute necessity." Once upon a time the bicycle was looked upon as a luxury. Then it became regarded legally as a necessary. The omen is a good one. Being a good omen, it has evoked the ungovernable fury—the almost inarticulate *odium theologicum*—of the notorious vicar of Hurley, who, apropos of this decision, calls automobilism "a scourge that increases monthly," and declares that his "feelings are altogether too strong to allow him to comment on the verdict" in the above case. Thank goodness!

Since writing the above, it is interesting to note that Lord Stanley, in his speech at the opening of the Olympia Exhibition, referred to the incident, and added that it was an extraordinary thing that the reverend gentleman could preach toleration on Sunday, and fail to practise it on the other six days of the week.

THE Pedrail, whose successful tour up to London we described on January 21st, and also last week, prior to its being subjected to the tests in the Long Valley, has now undergone an extended trial under

the supervision of the military authorities. It was originally intended to demonstrate the powers of the machine for pulling heavy guns into position, and the original scheme was to have tested the powers of the Pedrail for moving a 4.7 gun. Strangely enough Aldershot appears to have been unable to produce a gun of this calibre, and the demonstration of the Pedrail's capabilities had to be carried out with a wagon and trailer, loaded up with a weight of 5 tons. Pulling this load the Pedrail most successfully negotiated a number of exceedingly steep gradients, in particular it both descended into and successfully climbed out of a very stiff gulley, dragging its load behind it, while what was the most interesting feature of the demonstration was the successful way in which the Pedrail's feet negotiated the notorious sand of the Long Valley. The tests of the machine were made under the supervision of Captain Bagnall Wilde, R.E., Secretary of the War Office Committee on Mechanical Traction, and were witnessed by General Sir John French and a large number of other officers.

THERE has been a good deal of trouble with some of the motor cars that have been imported to South Africa, and the motor service between Mafeking and Potchefstroom has been interrupted owing to the failure of the vehicles to stand the knocking about occasioned by the so-called roads. This further accentuates the importance, on which we have always insisted, of cars for Colonial use being specially strongly built. When Mr. Diplock succeeds in adapting, as he promises to do, the Pedrail principle to lighter vehicles, this method of progression will be undoubtedly valuable on roads like those which evidently abound in the neighbourhood of Mafeking.



A contrast in locomotion in India (from the *Automobil-Welt*).

MR. CHARLES J. GLIDDEN still plods along on his globe-encircling tour. A cablegram just received from Campbelltown, the most southerly point of the South Island of New Zealand, states that he completed 1,145 miles of his world's tour through New Zealand, his total mileage to that date being 21,438 miles. Campbelltown is the most southerly point, we understand, to which any automobile has ever travelled in the world. Mr. Glidden can, therefore, claim that with his Napier car he has reached both the most northerly point (when he crossed the Arctic Circle) and also the most southerly point that any automobile driver has attained to.

A SPRIGHTLY and attractive account of a lady's automobile tour on a 6-h.p. Wolseley is published by the Wolseley Company under the title of "A Pleasure Jaunt." The writer has an eye for the picturesque features of English scenery, and the little book brings forcibly home to the reader the extent to which the motor car renders it easy to become acquainted with them. The supposed heroine of the adventure, "Kaiora," is opening a ladies' correspondence bureau at the Wolseley Works, to which ladies in request of automobile information are requested to address themselves.

THE lines of M. Serpollet's new steam racing vehicle are said to largely resemble those adopted in American machines, there being a sloping radiator in front, stretching right up from the front springs to the top of the boiler, which is mounted in front of the steering wheel. The reservoirs for water and fuel are situated behind the driver. The supply of fuel and water is effected independently in the racing Serpollet as in the touring vehicles which we described in reference to the Paris Show, and it is said that the vehicle starts from rest with an enormous acceleration and attains the speed of 80 kiloms. per hour almost immediately. Great anticipations are entertained of the performances of the car.

COMMERCIAL POINTS.

IN view of the remarkably successful manner in which the 12-h.p. Siddeley car completed its 5,000 miles reliability trial, it is perhaps only natural that the Anglo-American Oil Company should have asked us to mention that the fuel employed for it was their Pratt's "A" motor spirit.

AS usual, at all Automobile Exhibitions and Shows of a similar character, the success, from a spectacular point of view, is largely dependent upon electric light in order to obtain the best effect. At Olympia, the lighting arrangements, which were carried out by Messrs. Defries, are excellent.

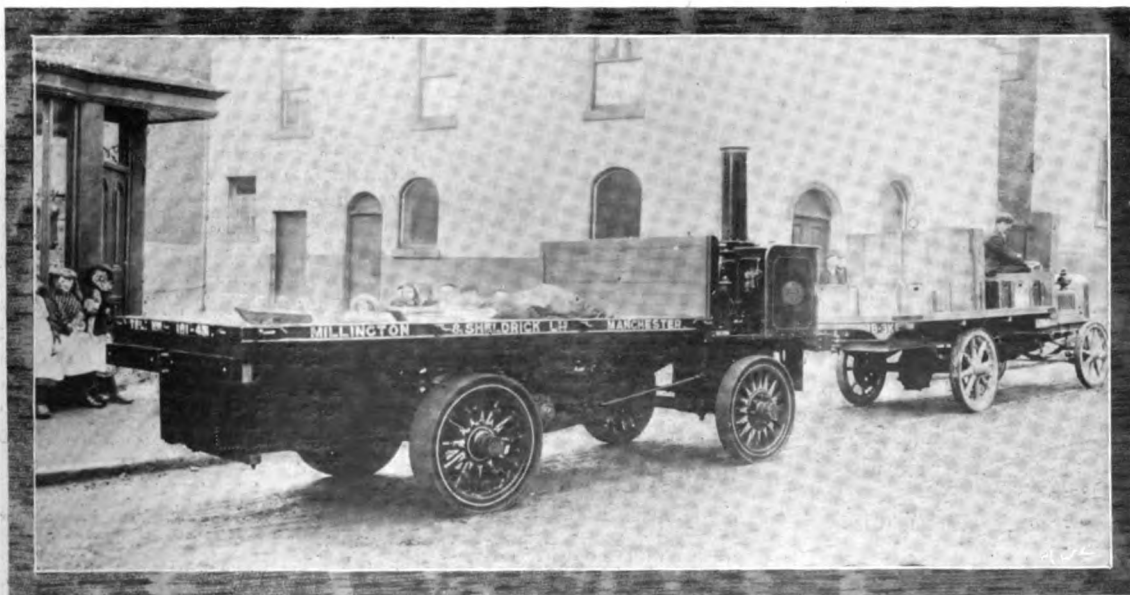
THE Brighton and Sussex Motor and Carriage Works have opened fine new premises at the Grand Hotel Garage, 13A, Canon Place, near the Metropole and all the chief hotels. Under the able direction of Mr. J. F. Constable, these premises have every requisite for users of motor cars, the capacity being up to 150 cars. Private lockups are provided and accumulators can be charged, whilst all ordinary repairs can be promptly attended to. In addition the Brighton Company have arrangements for letting out cars for short or long periods on hire.

MOTORISTS who like to keep up with the times and provide themselves with those improved accessories which are from time to time introduced will do well to secure a copy of the 1905 catalogue just issued by Messrs. Markt and Co. Veeder odometers, Jones and Goodlad's speed indicators are specialties retailed by this firm, while they also stock a very complete range of motor horns, bells, spanners, plugs, &c., among their numerous automobile accessories.

WE understand from United Motor Industries, Limited, that Mr. Arthur Macdonald, on the magnificent 6-cylinder Napier car which has recently done such splendid record work in America, used "D" oil throughout for lubricating purposes.

LAST week we reported that we were informed that the Dunlop Tyre Company had been notified from Bombay of the award of the gold medal for their "covers." We are now asked to correct this, and state that it should have read "tyres," owing to an error in the cablegram.

MESSRS. HUMBER, LIMITED, inform us that they learn by cable that they have been awarded the gold medal for cars, motor bicycles, and cycles, at the Cape Town Exhibition.



The rapidly growing popularity of petrol luries has, as previously recorded by us, induced the Lancashire Steam Motor Company—amongst others—to build this type of vehicle, in addition to their well-known steam wagons. One of their new 2-ton machines, carrying a load of 30 cwt. on its own platform, is seen in the above illustration, where it is drawing further load, consisting of a 5-ton steam lurry, which itself weighs about 4½ tons, up a gradient of 1 in 12—thus demonstrating the remarkable capabilities of the lighter type of vehicle.

The "Empire" Car.—Messrs. Shippey Brothers are, we understand, about to introduce to the English market a new car of American manufacture. It has been designed for moderate speeds, and for use with solid rubber tyres of the Swinehart concave pattern. The car will be of the live-axle type, and fitted with a 24-h.p. 4-cylinder engine. Ball bearings are to be used throughout the transmission, and the wheel base and track measure 8 ft. 6 in. and 4 ft. 8½ in. respectively.

IN our list of exhibitors last week published in connection with the four-page plan supplement of Olympia, Dougill's Engineering, Limited, was given as Donzill's Engineering, Limited. As the company think this may cause some confusion to readers, they ask us to draw attention to this alteration.

ONCE again the Ivel agricultural motor has been awarded for its capabilities with the plough, the Gold Medals of the Upton-by-Chester District Ploughing Society and the Sheppey and District Association, being the latest honours that it has achieved.

NEW COMPANIES REGISTERED.

Anglo-French Motor Company (Limited).—Capital, £20,000 in £1 shares. Registered in Guernsey.

Automobile Corporation (Limited), 24, Queen Victoria Street, E.C.—Capital, £1,000 in £1 shares. Director, E. A. Mackenzie.

Greyhound Motors (Limited), Woodthorpe Road, Ashford, Middlesex.—Capital, £1,000 in £1 shares. Object, to acquire the business carried on by W. H. Watson and A. F. Oliver, at Woodthorpe Road, Ashford, Middlesex, as Watson and Oliver. First directors, W. H. Watson and A. F. Oliver.

London Motor Car Company (Limited), 82, Victoria Street, Westminster.—Capital, £15,075 in 15,000 ordinary shares of £1 each and 1,500 founders' shares of 1s. each. Object, to carry on the business of hirers or letters of horseless cabs, carriages, omnibuses, &c. First directors, G. H. Baillie, R. H. E. Stevens, and W. W. Claypoole.

Motor Car Company, 1905 (Limited).—Capital, £2,000 in £1 shares. Object, to promote and protect the interests of the professions, trades, and industries connected with the design, improvement, manufacture, and supply of motor carriages, &c.



BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, 232, Strand, W.C.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

1380. 10th January, 1904. Improvements in or relating to the Driving Mechanism of Motor Vehicles or the like. Stephen E. Alley and another, Sentinel Works, Polmadie Road, Glasgow. The object of this invention is to provide a simple apparatus for use in the transmission of power from a motor to a spring supported driving wheel axle. There are three figures. Figure 1 is a plan of the construction. The main frame, A, supported on springs has cross bars to which are bolted the cylinders of the driving motor and the cross head guides, B. On the driving wheel axle, D, is mounted a gear wheel, E, and a differential gear, E', and a gear box or casing, F, supported on bearings, F'. The gear box also has bearings, F', in which fits a countershaft, G, on which is mounted a gear wheel, H, meshing with the gear wheel, E, on the driving axle, D. The shaft, G, is provided with cranks, G', balanced by weights, G', connected to the motor by the rods, B'. The gear box, F, is suspended from the frame of the vehicle, A, by the link, J, pivoted to lugs, F'. The link prevents the gear box from rotating, but the

controlling the admission to and the exhaust of steam from the cylinders of steam engines having steam admitted to one side of the piston only. There are fourteen figures. Figure 1 is a sectional elevation of an engine having this valve fitted. The cylinders, A, the pistons, B, the cranks, C, and the crank-shaft, C', are all of the ordinary construction. The cylinder cover, A', is constructed to cover both cylinders, A, with the single port, a, for the admission and exhaust of steam for each cylinder, and an exhaust port, a', for each cylinder opening into an exhaust chamber, A'. This chamber is formed between the two cylinders. Both ports, a, exhaust into this chamber, the steam exhaust pipe, a', shown in dotted lines being also connected thereto. On the cylinder cover, A', and covering the ports, a and a', is mounted a main steam valve, d, which is in the form of a disc fixed to and rotating upon the spindle, E. The disc steam valve, D, has a steam port, d, and an exhaust

Patent Specifications Published.

Applied for in 1904.

Published February 2nd, 1905.

- 5,281. A. H. DARE. Brake.
- 5,326. W. SISSON. Internal combustion engines.
- 5,422. J. J. AND W. K. MELDRUM. Internal combustion engines.
- 5,686. F. H. RICHARDSON. Anti-skidding devices.
- 6,065. M. O'CARROLL. Lubricating axes.
- 6,138. R. M. A. B. MUNRO. Steering and controlling devices.
- 6,805. G. P. SMITH. Gauge for petrol tanks.
- 7,908. H. H. MULLINER. Bodies.
- 16,227. N. A. DYAS. Variable speed gear.
- 17,103. —WARD. Cooling water supply.
- 23,017. A. H. ROBIN AND V. P. F. JANVIER. Underframes.
- 25,095. E. W. JUNGNER. Electric accumulators.
- 25,530. F. W. BRAMPTON. Wood wheels.
- 26,889. F. H. H. WARD and others. Lamps.
- 26,890. F. H. H. WARD and others. Acetylene generators.
- 27,072. W. A. TAYLOR. Carburetting systems.
- 27,065. G. E. HEYL-DIA. Pneumatic tyres.
- 27,101. G. WESTLE. Steering propellers.

Published February 9th, 1905.

- 937. T. B. BURGESS AND W. E. SCRAGG. Steam engines and valves.
- 1,380. G. E. ALLEY AND D. H. SIMPSON. Driving mechanism.
- 1,584. O. HIERONIMUS. Cooling.
- 1,674. F. KARMELI. Transmission gear.
- 2,082. G. F. KNOX. Cooling.
- 4,991. L. MACQUAIRE. Sparking plugs.
- 5,174. C. E. CHUBB and others. Suspension of frames.
- 5,830. E. C. F. OTTO. Resilient wheels.
- 6,427. L. ROZE. Air-ships.
- 6,658. A. E. AND A. F. DOBBS AND J. B. KERR. Lubrication.
- 6,956. D. ROBERTS AND J. W. YOUNG. Vaporisers.
- 7,796. J. THOMAS and others. Brakes.
- 20,807. U. S. G. MOWRY AND C. W. VAN WINKLE. Motor vehicles.
- 20,940. C. DE CLERCQ. Carburettor.
- 24,163. R. MILLER. Explosion engines.
- 24,176. MARQUIS A. DE DION AND G. BOUTON. Carburettors.
- 24,643. G. D. LEECHMAN. Side cars.
- 25,874. F. C. BLAKE. Reversing gear of boats driven by explosion engines.
- 27,506. R. J. A. DELACROIX. Change-speed-gear.
- 27,724. W. GRAY. Lumps.

Published February 15th, 1905.

- 2,364. A. TREEBY. Vaporisers.
- 4,638. T. HUMPHREY. Variable speed-gear.
- 5,008. A. CLEMENT. Carburettors.
- 5,362. F. H. VEULLE. Contact breakers.
- 5,820. W. POLAND. Carburettors.
- 6,444. E. S. HINDLEY AND W. STANFORD. Steam boilers.
- 6,570. J. MACKINTOSH. Oil or gas turbine engines.
- 6,764. A. GOVAN AND SAINSBURY'S ANTI-SKID-DECKERS, LTD. Skid preventers.
- 6,878. A. ECKSTEIN AND H. J. COATES. Ignition apparatus.
- 6,906. H. HARBORD AND T. THOMAS. Driving belt.

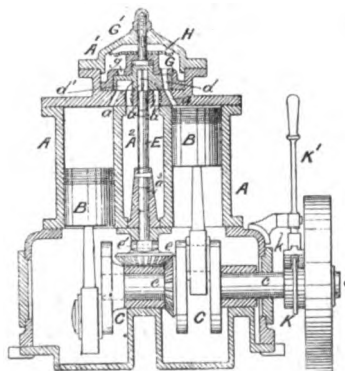
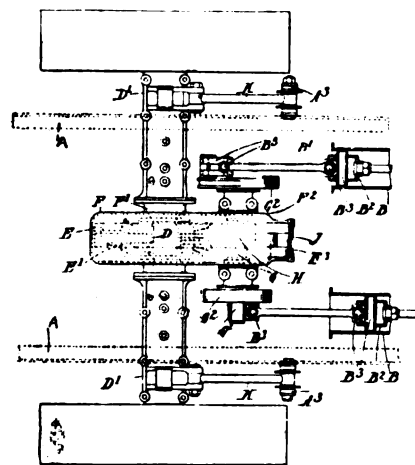


FIG. 1.

port, d', of sufficient width to connect the port, a, with the exhaust port, a'. The spindle, E, and the disc valve, D, are rotated by bevel gearing, c, the valve opening and closing the ports, a and a', in succession alternately admitting to and exhausting from the cylinders, A. Over the rotary disc steam valve, D, is fitted a cut-off valve, G, also of disc shape, provided with two steam admission ports, g, placed over the steam ports, a. The cut-off valve is capable of rotary motion over the main valve, D, to adjust the relative positions of the ports, g, and the ports, a, to control the admission of steam and the cut-off. It is held upon its seat on the valve, D, by the spring, H. The valve, G, is fitted on its underside with teeth so that its position may be regulated by a gear wheel and spindle from the outside. The cover, G', fits over the valves, D and G, and forms a steam chamber. The bevel wheel, c, fits loosely on the spindle, E, and is secured to it by a pin, c', to permit it to rotate part of a revolution when it is desired to reverse. A double ratchet wheel, K, with a pawl, k, fitting same provided with a handle lever, K', by which, when placed in gear, the crank-shaft can be rotated part of a revolution in either direction. Feb. 8th, 1905.

play of the joints allows the gear box to tilt, and the link allows the axle to rise and fall. The axle, D, is held in position by radius bars, K, connecting the axle boxes, D', with joints, A', on the frame, A. The tilting or endwise movement of the shaft, G, is permitted by the double joints, B', at the ends of the connecting rods, B', while the guide, B, in which the cross heads, B', rotate is cylindrical. This allows further movement for tilting. Clearance is left in the ends of the cylinders to allow for a slight variation in the position of the stroke. A third shaft may be introduced and change-speed pinions provided between the shaft, G, and the axle.—Feb. 8th, 1905.

937. 14th January, 1904. Improvements in Steam Engines and Valves therefore applicable for Motor Cars and other purposes. Thomas Burgess and another, of Congleton, Cheshire. The object of this invention is to provide an efficient valve for

The Automotor Journal, February 25th, 1905.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

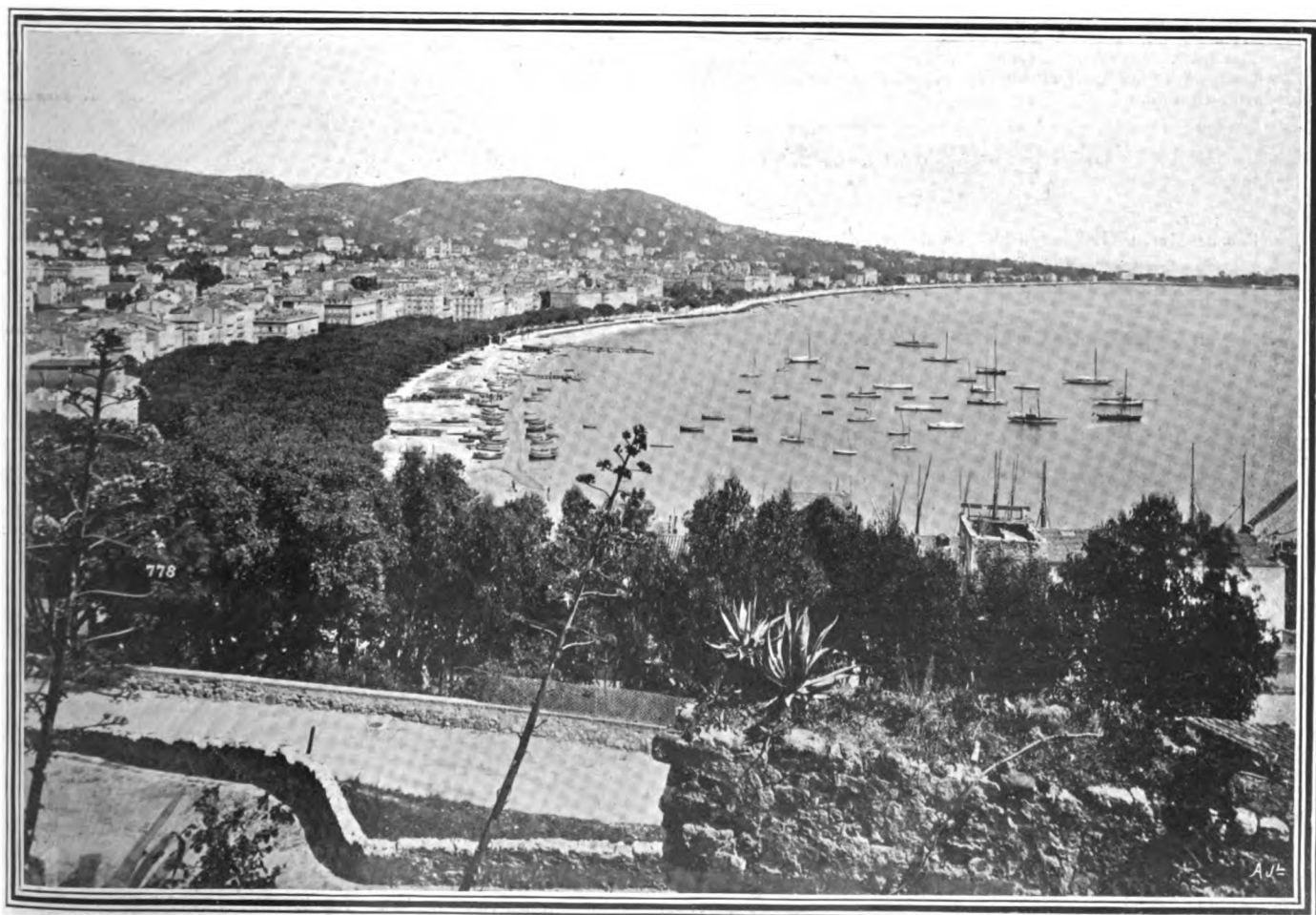
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FEBRUARY 25TH, 1905.

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AUTOMOBILISM ON THE RIVIERA.—General view, from Mount Chevalier, of Cannes, where the opening of the 1905 automobile season on the Continent has this week taken place.

THE AUTOMOTOR JOURNAL.

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NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C., by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
Feb. 24-Mar. 4	Edinburgh Motor and Cycle Show.
Feb. 24	Manchester Motor Show.
Mar. 3-11	Liverpool Motor Cycle Show.
Mar. 8	*A.C.G.B.I. General Meeting.
Mar. 18-25	Cordingley & Co.'s Exhibition (Agricultural Hall).
Mar. 21	Motor Van and Wagon Users' Association Dinner.
Mar. 25	Motor Cycling Club Brighton Run.
Apl. 3-10	Auto Cycle Club Light-weight Trial (1,000 Miles).
Apl. 29 or May 1	May Day Parade
May 6...	Auto Cycle Club Hill Climb.
May 11-13	Scottish A.C. Reliability Trials.
May 12 or 19...	*Quarterly 100 Miles Trials.
May 13	Auto Cycle Club Members' Penalty Run.
May 20	200 Miles Trial (Motor Cycling Club).
May 30	*Gordon-Bennett British Eliminating Trials.
May 31	Auto Cycle Trials and "Selection" Race.
June 10	*South Harting Hill-Climb (Members A.C.G.B.I.).
June 10	London-Edinburgh (Motor Cycling Club).
June 24	100 Miles Passenger Trial (Motor Cycling Club).
July 1	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 8...	Auto Cycle Club Consumption Trial.
July 13	*Hill-Climb (Henry Edmunds Trophy).
July 19-22	*Brighton Speed Races.
July 24-28	*Motor Boat Trials (Southampton).
July ...	24 Hours Run (Motor Cycling Club).
Aug. 11 or 18	*Quarterly 100 Miles Trials.
Aug. 14-19	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 19	*Van Trials, Light and Heavy Vehicles.
Aug. 26	Inter-Team Trial (Motor Cycling Club).
Sept. 9	Brown Cup (Motor Cycling Club).
Sept. 12	Auto Cycle Club Race Meeting.
Sept. 14	*Tourist Trophy (Isle of Man).
Sept. 15	*Daily Graphic Cup (Isle of Man).
Sept. 18-Oct. 3	*Reliability Trials.
Oct. 4	*Speed Trials.
Nov. 10 or 17	*Quarterly 100 Miles Trials.

* Automobile Club of Great Britain and Ireland Events and Papers.

Foreign Events (Trials, Races, &c.).

1905.	
Mar. 13-18	Boston Exhibition.
Mar. 15-Apl. 9	Copenhagen Exhibition.
Mar. 16-29	Vienna Exhibition.
Mar. 27-Apl. 5	Washington Exhibition.
Apl. 2-16	Monaco Motor Boat Fortnight.
Apl. 14-23	Nice Automobile Week.
Apl. 17	Speed Mile and Kilometre (Nice).
Apl. 18	Coupe de Caters (Nice).
Apl. 20	Coupe Burton (Cannes).
Apl. 20-21	Cannes Motor Boat Meeting.
Apl. 23	Coupe Provinciale (Nice).
May	Paris Industrial Vehicles Trials (A.C. France).
May 4-12	Auto Cycle Club de France Tour.
May 11-25	Stockholm Automobile Exhibition.
June 18	International Motor Cycle Cup.
June 26	Mont Cenis Hill Climb.
July 11	Start for Glidden Trophy (New York).
July 15	Calais-London (Motor Boats).
July 30	Circuit des Ardennes.
Aug. 6-9	Paris-Trouville (Motor Boats).
Aug. 10	Gaston Menier Cup (Motor Boats).
Aug. 11	Anthony Drexel Cup (Motor Boats).
Aug. 12	International Cup for Motor Boats.
Aug. ...	Herkomer and Bleichroder Races.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Vincenzo-Florio Cup.
Sept. 1	Lake Geneva Motor Boat Meeting.
Sept. ...	Tourist Car Trial (A. C. de France).
Sept. 3-10	Royan Meeting.
Sept. 3-10	Spa Automobile Club.
Sept. 11	British International Cup (Motor Boats Arcachon).
Sept. 12-14	Lake Lucerne Motor Boat Meeting.

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PASSING EVENTS.

The Closing of the Great Show.

THE closing days of the great Exhibition were almost more successful than the first days, with which we dealt last week. So much, indeed, was this the case, that the Show was, by general consent, kept open on the Monday of this week. As the Exhibition has closed, we are able to review it now in the light of a past event, and we can unhesitatingly declare that never before has a show been held in this country in which the visitors to it were so much attracted by real business considerations. Previously, the majority have consisted of a curious, and in the earlier days semi-disdainful, crowd. This year the majority has consisted, as far as can be judged by the results, of intending buyers, and the orders booked by the leading firms have in consequence been phenomenal. The number of visitors has been phenomenal too—a grand total of upwards of 200,000 having passed the turnstiles. The fact is an interesting confirmation of the general recognition of the automobile as an established institution. The Olympia Exhibition was evidence not only that the automobile had become recognised by Society, but it was apparent that many of the visitors were convinced that not to possess an automobile was to be behind the times.

Under these circumstances, satisfactory as they are, it is unfortunate that what everyone looked forward to as the crowning element of success of the Exhibition, a possible visit by King Edward, should not have become an actuality. Had a little more diplomacy been exercised, we should have certainly been able to chronicle the presence of His Majesty at the Olympia Show, as there is little doubt that the King was originally inclined to honour the Exhibition. A second and *official* visit from the Prince of Wales was also hoped for, but whether His Royal Highness thought there was a little too much publicity about the "private" view in which he indulged on the day prior to the opening of the Exhibition, or whatever may have been the reason, no second visit by the Prince to this truly splendid Exhibition took place. Possibly the King may also have been influenced by somewhat similar considerations to those which weighed with the Prince of Wales. Particularly in the case of *private* visits, etiquette and the consideration and respect due to exalted personages cannot be too carefully observed.

Not to Let the Effect Evaporate.

THAT the leading manufacturers and agents have been so successful in booking orders at the present Exhibition, must unquestionably be largely due to the extent to which they have very wisely kept their names before the buying public in the automobile world during the year preceding the Exhibition. Many manufacturers and many agents have, we are well aware, booked orders at the recent show which it will take them fully a year to supply, and for the time being, therefore, they are not in need of any further business. They will, however, make a very serious miscalculation if they refrain from keeping their names as prominently before the public in the future as they have made a point of doing in the past. It is a great thing to be full up with orders for even a single year, but continued prosperity means that this shall be the usual condition of those concerned, and that this may be so, it is essential that they should keep themselves as prominently before the public in the future as

they have done in the past. Indeed increased prominence will probably be needed, for hardly a month passes without witnessing the entry into the lists of fresh competitors, and competitors very frequently well supplied with capital and technical ability. If, then, manufacturers allow themselves to slip out of the public view they will in all probability find, when next year's Exhibition is held, that their position has become a very different one than that which it has proved to be on the present occasion.

* * *

THE great success and representative character of the Exhibition just held at Olympia have brought forward prominently the great importance of inducing the trade generally to agree to holding only one Exhibition annually. Provided every exhibitor is enabled to put before the public one model of his most recent designs, every object that can be accomplished by an Exhibition is attained. It is an all round advantage to everyone that all the different models should be assembled in one and the same building, at one and the same time. With this object in view, arrangements have been practically made to enlarge the Olympia premises by extending the main roof so as to cover the Annexe, an improvement which will have the effect of adding at least one-third more available space to the exhibition hall. In order to enable exhibitors to be early in the field, and to place manufacturers in a position to meet the requirements of their agents and customers as early as possible, the Society of Motor Manufacturers and Traders have determined to hold their next Show in the latter part of November, 1905. Considering the space that will be then available, there is little doubt that that will be the one automobile show of the year, and, coming at that time, it will enable manufacturers and agents to book orders well in advance for the ensuing year.

* * *

The Tramway People Becoming Afraid.

THE extent to which the electric tram people are beginning to recognise the serious character of the competition with which they are threatened by the motor 'bus, is well illustrated by the fact that the electrical papers are publishing articles showing to the satisfaction of themselves, and possibly of some of their readers, that the motor 'bus can never successfully compete with the electric tram. These articles, it is hardly necessary to point out, do their best to minimise the importance of the enormous prime cost in the case of installing electric trams, and do their utmost to magnify the cost of running of motor 'buses—a significant element in their estimate of cost being that wages for motor 'bus drivers and attendants will form the principal source of expenditure, and will be very high. Needless to say, these elements of expenditure will be regularly decreasing, and altogether the articles which have been appearing on the subject are of more interest as an indication of the panic created, than of the strength of the case which they attempt to support. An important point dealt with by the writers is that electric tramcars can, and do, safely proceed at 20 miles an hour on the level, and that motor 'bus services from 14 to 20 miles per hour could not be operated with safety to the general public. We should like to know why. A motor 'bus travelling at a certain speed is certainly not more dangerous, but much less dangerous than a tramcar travelling at the same

rate, for the reasons which we have frequently pointed out, that the tramcar's movements are inflexible, while, in addition, there is the difficulty of pulling up quickly on rails. Above all, the tramcar is restricted legally by order of the Board of Trade, at any rate in the metropolis, to 10 miles an hour. This has been satisfactorily demonstrated by the actions taken some time ago by Mr. Moffat Ford, and if the competition becomes at all keen it will be necessary to adopt an extension of his tactics. It cannot be tolerated that one set of undertakings competing for public patronage should regularly break the law, while others are compelled most carefully to observe it. If the electric trams are restricted to their Board of Trade limit, their competition with adequate motor 'buses will be far from serious.

The Park Speed Limit—Extraordinary Proceedings.

WE have chronicled, from week to week, the comedy which has been proceeding at the various London Police Courts, and in its final stages at Bow Street, regarding what we consider the total illegality of the imposition of the 10-mile speed limit in certain of the London parks. Our readers will remember that one of the first cases came before Mr. Kennedy, and that he adjourned his decision until the defence should prove that the action of the police was illegal. Another case then came before Mr. Marsham, of Bow Street, and Mr. Kennedy then adjourned the case that had come before him, until Mr. Marsham should give his decision. In our last week's issue we described the recent proceedings at Bow Street. Mr. Staplee Firth, who represented several of the defendants, had on a previous occasion produced evidence from the House of Lords that the park rules under which the prosecution was instituted, had never been laid before Parliament as the Act of 1872 requires that they should be. Mr. Marsham then adjourned the case, and decided to give judgment on it a fortnight later. All the evidence had been produced, and the case was practically closed, but to the astonishment of every one concerned, on the day when Mr. Marsham should have given judgment, Mr. Bodkin, instructed by the Director of Public Prosecutions, turned up, and was allowed to re-open the case on behalf of the police. The proceedings were again adjourned to allow Mr. Marsham to consider the various arguments, and he announced that he would give judgment on the 21st inst. Even then, however, there was another surprise in store, and the Commissioner of Works sent up a gentleman who, in spite of the fact that the case had been twice closed, was allowed to enter the witness-box and give evidence to the effect that the so-called park rules promulgated by the police had been laid before the public in the office of the Commissioner of Works, though even he did not maintain that they had been duly advertised in the *London Gazette*. Mr. Marsham then proceeded to give judgment, and the judgment he delivered certainly produced the impression that he was being influenced from above against his own convictions, for he was willing to state a case, or do anything to enable the matter to be brought before a higher tribunal. He decided to convict in one case, and fined Mr. Gwinner £2 and costs, to enable the legality of the proceedings to be tested in the Divisional Court. We are enabled to state that the defendant, Mr. Gwinner, has decided to test the legality of this decision by applying for a *certiorari* in the Divisional Court. The other cases, Mr. Marsham adjourned *sine die*, which presumably means until the Divisional Court has decided the question.

Preparing for the Next Bill.

SIR JOHN MACDONALD, who is always on the lookout for an opportunity of benefiting the cause of automobilism, took occasion, at the last meeting of the Automobile Club Committee, to draw attention to what is one of the most important matters that can engage the attention of those interested in the future and well-being of automobilism both as an industry and a pastime. Sir John Macdonald recalled to the attention of the committee the fact that in about a year from the present date the question of further legislation will be brought before Parliament. Whatever decision is taken by our legislators when the present Act comes up for review, cannot fail to profoundly affect the future development of automobilism in this country, and Sir John Macdonald is therefore rendering timely service in pointing out how important it is that automobilists should in the meantime make their power apparent, and so render Members of Parliament generally, if not exactly, anxious to conciliate automobilists as a body, at any rate anxious to refrain from seriously irritating or estranging them. It is sound policy. There is nothing so calculated to command consideration as an exhibition of power and importance. In this sad world of ours the appeal to it is always much more forcible and effective than any appeal to principles of right and justice. And automobilism is becoming powerful. Far more powerful than most of the framers of the 1903 Act imagined, in the days when that measure was passed into law, that it would in so short a time become. Sir John Macdonald's programme is simple, and will probably to a large extent be efficacious. He proposes that on some day this year, preferably in the month of June, and on a Saturday for choice, all the motorists in the Kingdom should combine together and hold a great demonstration. "We want," says Sir John, "to convince the public that we are indeed a large and important body, and a body that is steadily and rapidly increasing." Perhaps it would be best if the great demonstration could be held at one spot. But this, as Sir John Macdonald recognises, is clearly impossible, and he proposes instead that a number of local demonstrations, taking in most instances the local clubs for centres, should be organised throughout the country. This will probably have almost as good an effect. Certainly it will be a timely reminder of the enormous interests at stake—a proof of the dimensions which the industry has attained to, and an object lesson to even the most reactionary that they can no more effectively oppose its growth than they can mop up the Atlantic with a sponge.

Another Method to be Recommended.

A REVIEW of the existing law is indeed of such pre-eminent importance to every automobilist that it would be a great pity should their determination to obtain better terms from the Legislature, in the next Act that is passed into law, stop short at mere demonstrations of their numbers, as proposed by Sir John Macdonald, excellent and effective as that scheme will no doubt prove to be. There is still a more powerful and effective weapon, which it is hoped all automobilists will avail themselves of. Time after time, at the various by-elections, we have drawn attention to the great services rendered by motor cars. In fact, in a constituency in which parties are anything like equally balanced, the victory is certain at the present day to go to the candidate who can provide most automobiles to

bring the voters to the poll. In spite of the immense amount of automobile support that has been accorded to candidates at these by-elections, we hardly remember a single instance in which the opinions of either candidate on the automobile question were asked by car owners, before putting cars at his disposal. Let automobilists throughout the country from now on, until the next Motor Car Act is passed, agree to sink all political differences as far as possible, and refuse to place their cars at the services of any Parliamentary candidate unless he is in favour of a more conciliatory measure, and the battle will be won at a single stroke. It is not much to ask of automobilists for the good of the movement. It would not really mean any sacrifice of political conviction, for there is scarcely a would-be Member of Parliament in the country who would refuse to give the required pledges. Certainly he would not refuse to do so, if he knew that automobilists generally were united on the point, and that, in the one case, he could command organised and powerful support, which, in the other case, would go against him. It is nothing short of ridiculous that automobilists possessing as a class such a power, should be willing to permit the re-election to the House of Commons of so large a number of fanatical anti-automobilists as were present in it when the last (Motor Car) Act was passed. Automobilists *can* control Parliament if they wish. It will be their own fault if they fail to do so.

The Gordon-Bennett Controversy.

THE Gordon-Bennett Race has for this year, at any rate, been saved as a separate institution. The International Gordon-Bennett Commission held its meeting on the 20th inst., as we announced last week it would do, and after a protracted discussion, lasting about six hours, ultimately decided to hold the Gordon-Bennett Race on the Auvergne Course fourteen days before the Grand Prix should be run. It is evident, as the proceedings were of such a lengthy character, that the French club did not give in without a pertinacious fight. However, when the Commission did agree, its unanimity was wonderful, for ultimately there was not a single dissentient voice. Everybody will be pleased with the result. In the first place, the Gordon-Bennett Race maintains its position as the blue ribbon of the automobile racing world, and maintains its position as an independent event about which a very special degree of interest centres. Above all, the danger which threatened in connection with the proposal to run two such important races together, *i.e.*, the extent to which accidents would be courted by such a proceeding, and the outcry which such accidents if they occurred would have undoubtedly raised, would have seriously injured the whole automobile movement. The Automobile Clubs of Great Britain and Germany, to which bodies the satisfactory result is mainly due, are to be heartily congratulated on their successful opposition to the French proposals, and on the ultimate outcome of the stand which they have made.

Another Richmond in the Field.

WHILE congratulating the two clubs, and the other clubs which so loyally supported them, one cannot help thinking that the result is also to a certain extent due to the action of Mons. Georges Prade. M. Georges Prade has all along been opposed to the unsportsmanlike

proposals put forward by the A.C.F., in regard to the Grand Prix Race, the original idea of which, it will be remembered, he himself suggested, and he has pointed out, in no ambiguous language to the A.C.F., that their line of action and general attitude has been alienating the other European Clubs. M. Georges Prade has now, in conjunction with *Les Sports, Le Journal*, and the Municipality of Aix les Bains, arranged to found a prize of the value of 150,000 francs, for a race over a distance of 500 to 550 kilometres, the event being open to any manufacturers in the whole world who like to enter three cars or less. When M. Georges Prade first proposed the original Grand Prix, he suggested calling it the "Grand Prix de la République," and this name will be given to the new event which he is now organising. It is very probable that the Grand Prix de la République will tend to deprive the Grand Prix of the A.C.F. of some of its glory, and it is quite conceivable that the organisation of this event, and the results which may possibly spring from it, have had, as we have already suggested, a good deal to do with inducing the French Club to accede to the representations of the members of the Gordon-Bennett Commission.

Turning Things Upside Down.

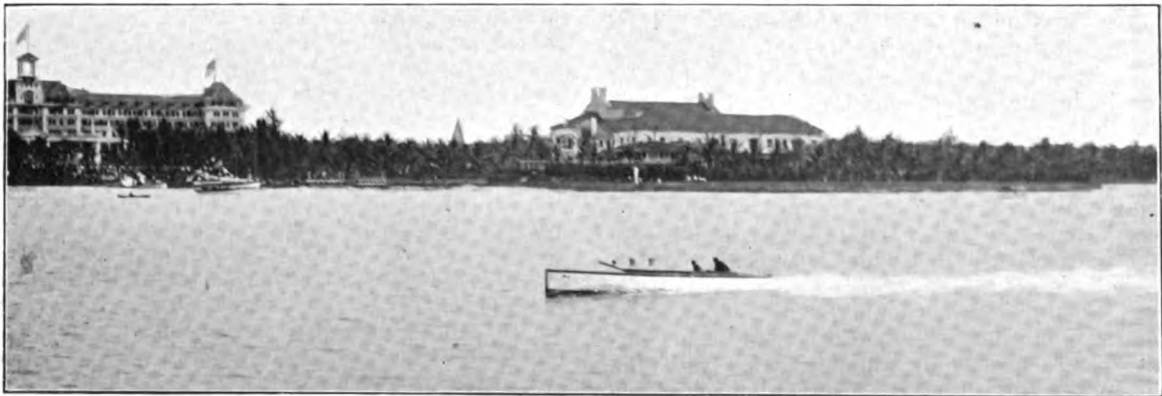
IT is very good of our engineering contemporaries to display the increased and increasing interest in automobilism which they have recently shown. It was not ever thus. There was a time when the engineering side of automobilism, and every other side of it for that matter, was most studiously ignored by the very papers whom one would have expected to display a special interest in the subject from the start, and to have guided motor car constructors and designers with an inspiring, not to say fatherly, interest. Instead of that, however, the automobile movement was studiously ignored, not to say discouraged, for many years, until, in fact, it had become too powerful to be ignored any longer. When the subject was referred to in the early days of the movement in certain of the publications to which we refer, the general attitude adopted was a disparaging one, and automobile engineers were lectured as to how much better they would have succeeded had they done something quite different to what they were doing, and had they consulted the people who could have given them really useful advice. We have some recollection of traction engine designers being held up for imitation in this connection. Now, however, all this is changed, and our engineering contemporaries are bestowing considerable attention on automobilism generally and the recent show in particular. Alas, their insight and accuracy does not always correspond with their increased interest, and just now automobilists are smiling over certain technical papers which have carefully reproduced illustrations of an up-to-date change-speed-gear that is employed by one of our leading English motor car companies—but—unfortunately, *upside down*.

THE Right Hon. Andrew Graham Murray, till recently Secretary for Scotland—an enthusiastic automobilist, as our readers are aware—had scarcely been elevated to the Peerage when he fell into the clutches of the police, and was fined at Slough recently the sum of 10s., including costs, for that his light which shone upon the identification plate at the rear of his car, had become extinguished while the car was being driven.

A MOTOR BOAT CARNIVAL.



PALM BEACH (FLORIDA) BOAT MEETING.—Mr. W. J. Morgan starting for the Motor Boat Races.

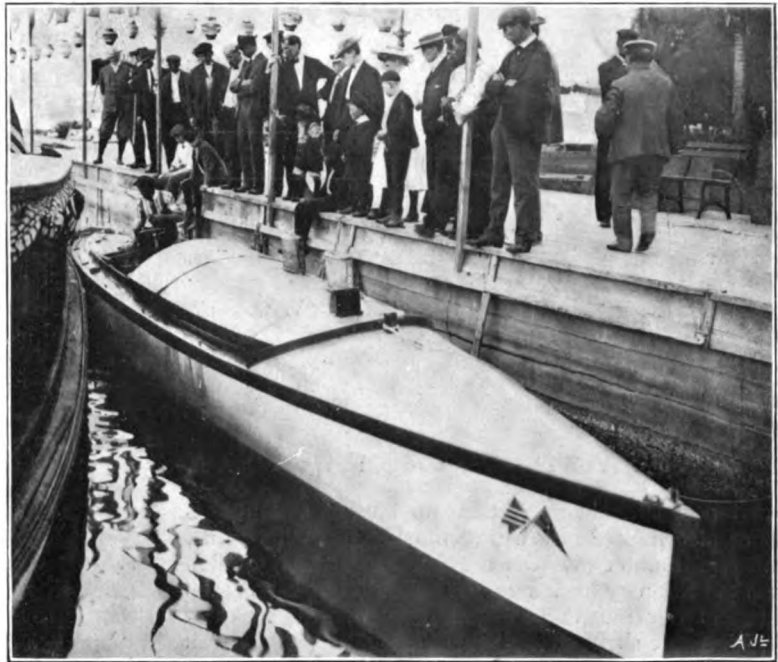


PALM BEACH (FLORIDA) BOAT MEETING.—Mr. W. G. Brokaw's splendid craft "Challenger" at full speed, driven by Mr. Proctor Smith. As we announced last week, the record speed of the world was made by this motor boat, she having been timed over a mile in 2 mins. 2 secs., equivalent to a speed of $29\frac{1}{2}$ m.p.h.



PALM BEACH (FLORIDA) BOAT MEETING.—Watching the races on Lake Worth.

Palm Beach Motor Boat Meeting.—Not content with the automobile races at Ormond, Florida, a number of those who participated in that gathering betook themselves afterwards to the motor boat meeting, which had been arranged at Palm Beach. This was the first international series of boat races held on Lake Worth, and was voted particularly successful. The entries were not over numerous, but what was lacking in quantity was made up for in quality and good management, the latter being in striking contrast to the Beach meeting which had just previously been concluded. In the result, Mr. Brokaw's "Challenger" proved a giant among Tritons, and triumphed all along the line. Particulars of the fine times made by this splendid boat were given by us in our last two issues, and we are now able to reproduce some interesting photographs of this water carnival, showing, amongst other pictures, "Challenger" at full speed and also at close quarters. She is, it will be remembered, a 40-ft. boat, built by Messrs. Smith and Mabley, and came over here last year to compete for the British International Cup. We gave full particulars at that time.



PALM BEACH (FLORIDA) BOAT MEETING.—Mr. Brokaw's 150-h.p. boat "Challenger" at close quarters.

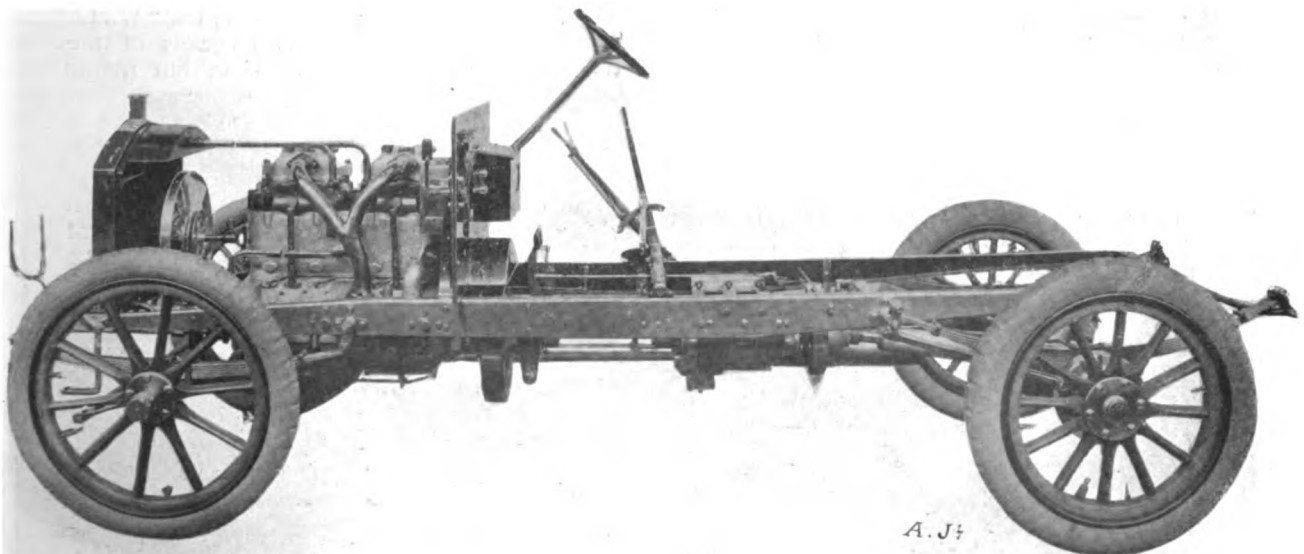


THE OLYMPIA EXHIBITION OF 1905.

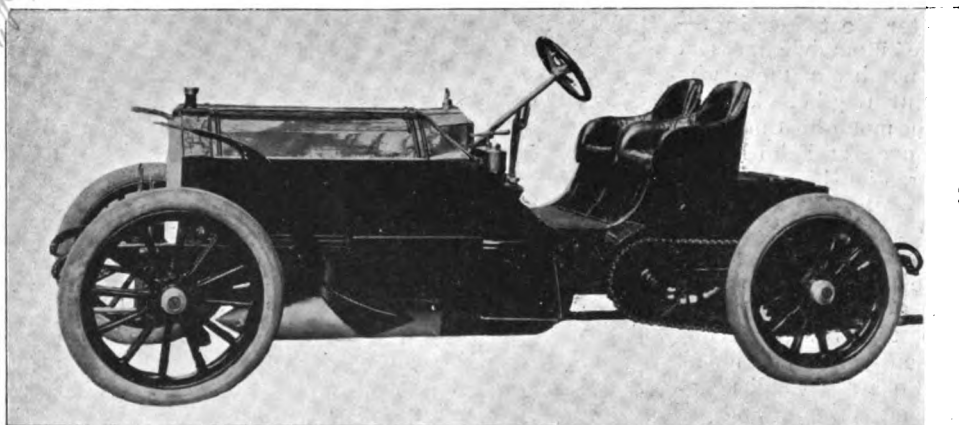
(Continued from page 214.)

CONTINUING our report from the point at which we left off last week—when we were still dealing with the British pleasure vehicles—a few words might, in the first place, be said with regard to the very large number of landaulettes and other town vehicles which were on view. For the most part, the chassis employed are the same as those used for the touring vehicles, so that the bonnet in front of the dashboard is more often than not

retained. Such firms, however, as the Wolseley Company and James and Brown are able to take advantage of their horizontal engine systems to improve the appearance, and to reduce the length without deviating materially from existing design. Noticeable amongst the few exceptions, at the Show, was the new petrol landaulette of the Electromobile Company, which, although it has a 4-cylinder vertical engine of the Napier type, and



AT OLYMPIA.—Side view of the new 4-cylinder, 40-h p. Napier Chassis, which is of the live-axle type and has all the latest Napier improvements.



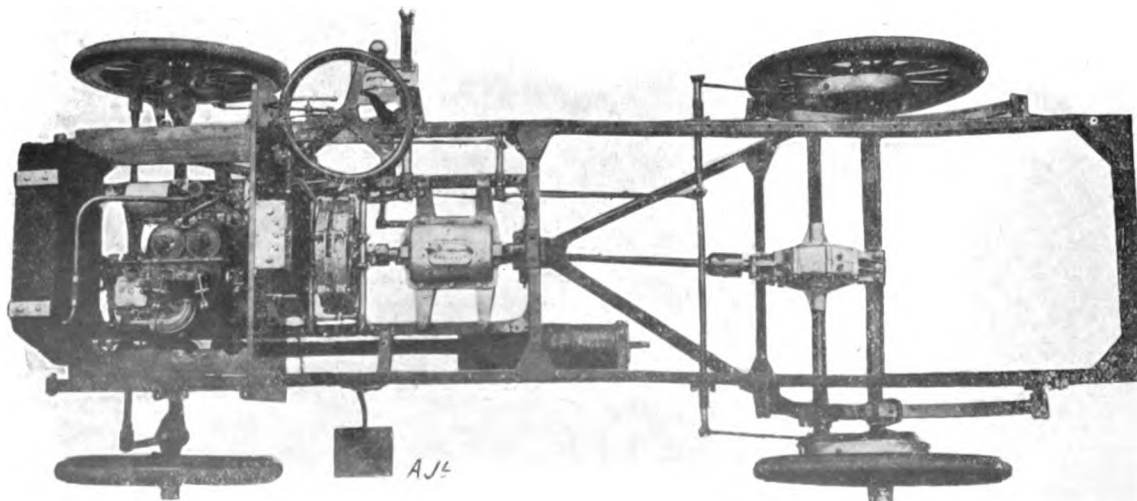
AT OLYMPIA.—The 90-h.p. Mercedes Car, shown by the Cannstatt Automobile Supply Association.

is driven by side chains, yet has no bonnet, and has its chains placed inside, instead of outside, the main-frame. This construction involves the adoption of a modified form of stationary back axle, the ends of which—as seen in one of our illustrations—are bent upwards to carry the short axle shafts that connect the chain-wheels with the road-wheels.

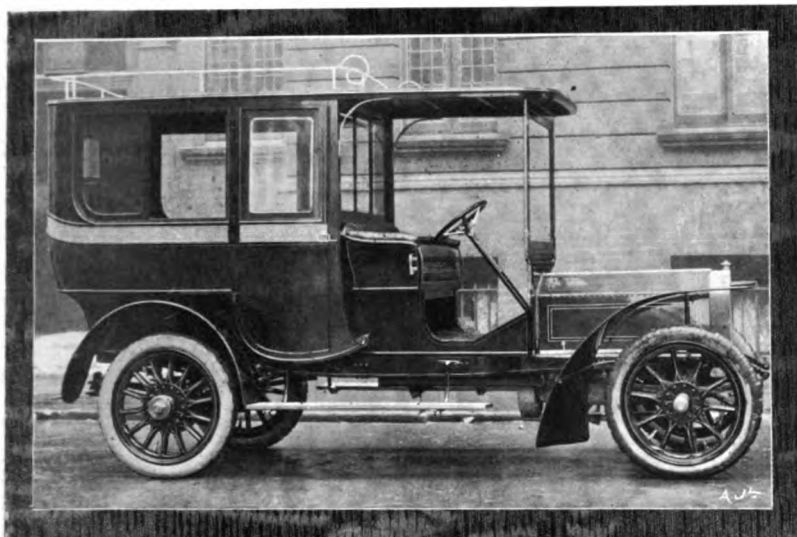
Apart from the cheaper models that have been designed specially for the “man of moderate means,” and from the very low-priced 4-cylinder cars—both of which will presently be mentioned separately—the other British vehicles, not hitherto referred to, included the Wilson-Pilcher, the Rolls-Royce, the Enfield, the Argyll, and the Ryde. The 12–16-h.p., 4-cylinder, and the 18–24-h.p., 6-cylinder, Wilson-Pilcher models have undergone comparatively little radical alteration in design since last year, and, needless to state, the workmanship of the well-known Armstrong-Whitworth firm is quite in keeping with the high character previously attained by the designers themselves in their own shops; possibly the chief changes are that steel stampings now replace malleable castings to a great extent, and that an improved form of radiator has been adopted. The Rolls-Royce cars, which, it will be remembered, include a 6-cylinder vehicle, were fully described by us only a month or two ago, and were also brought prominently to the fore at the Paris Salon. The Enfield Company's

new 20-h.p. vehicle is of the live-axle type, with a 4-cylinder engine, and its two most interesting features are its propeller-shaft and its clutch. The propeller-shaft is constructed of three steel bars, which render it flexible, and therefore constitute a kind of “spring-drive,” while the clutch has, combined with it, a brake in somewhat the same way as on the Chenard and Walcker vehicles, whereby the brake comes into action when the clutch-pedal is fully depressed. The Enfield vehicles, which are made at Redditch, are apparently very well built throughout. The chief points of the Argyll cars were given in our issue of the week before last. The Ryde vehicle, which is manufactured at West Ealing, is of the live-axle type, and has a 3-cylinder 16-h.p. engine.

As we have previously pointed out, the majority of the best foreign vehicles have also been on view at Olympia, and quite a number of those that formed the leading attractions at the Paris Salon were amongst them. Before coming to the Continental makers, however, and since only passing notice is necessary in view of the full treatment that they have recently received at our hands, mention should be made of two prominent exhibits of large American touring vehicles—viz., the “White” and the “Winton.” Not only was a chassis of the new 15-h.p. White steam car on view, but the makers brought before the notice of the public some extremely



AT OLYMPIA.—View of the 12-h.p. Ryknield Light Van Chassis, which is constructed for loads of about one ton.

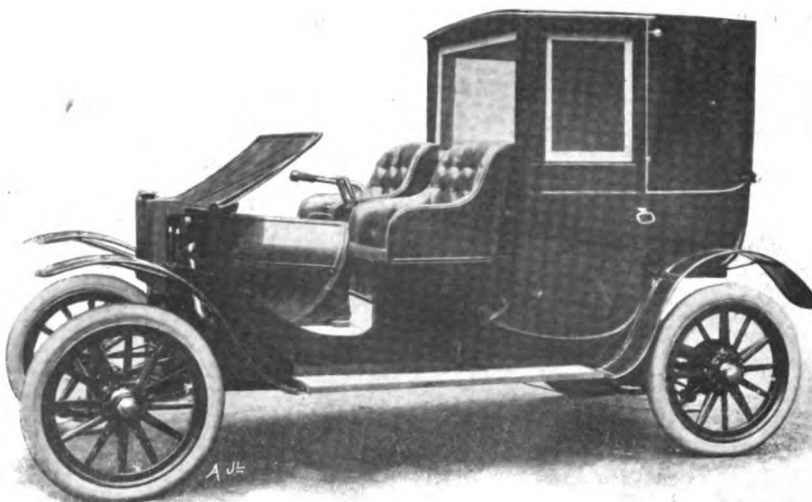


AT OLYMPIA.—The 6-cylinder, 30-h.p. Rolls-Royce Car, fitted with Pulman Limousine body to seat seven persons.

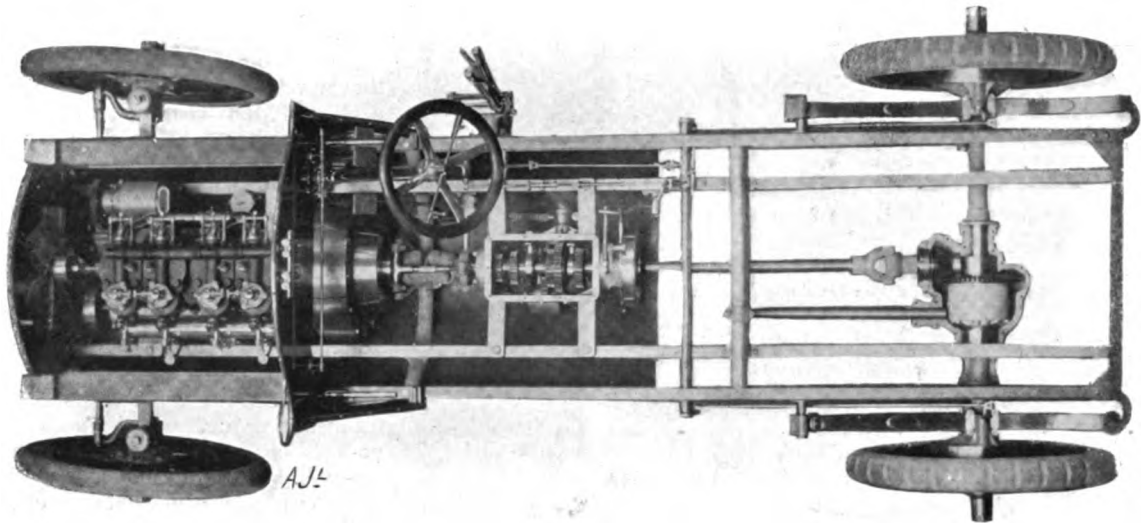
handsome and comfortable bodies of various kinds, that are being specially built in this country to suit the varied requirements of their English clients. The chassis naturally attracted a very great deal of attention, owing to the remarkable successes secured by the firm, and the complete cars demonstrated the fact that the mechanism in no way interferes with the employment of up-to-date and thoroughly artistic carriage work. The new Winton model, with its 4-cylinder vertical engine, proved interesting in many ways, for, although the earlier 20-h.p. horizontal type has many of the same characteristics, yet they are more easily seen on the latest model. The ingenious pneumatic governing system for the inlet-valves, and the individual clutches for each speed—instead of having a main clutch—are cases in point, while, in addition, the duplex side springs, the mechanical lubricator, and the high-tension magneto, are all recently imported features. The springs are so made that only the lower leaves are normally operative, but that the upper half of the spring automatically comes into play as soon as the load is sufficient to require them. The lubricator has a revolving drum that picks up a certain amount of oil from a chamber in which the level is kept constant by a float-feed device, and the thickness of the film of oil, which it carries over and delivers into the feed-pipes, can be varied by a kind of scraper-blade that can be brought nearer to, or be moved further away from, the roller; the high-tension magneto is somewhat similar to that of the "Eisemann" pattern, for the induction-coil is constructed separately, and forms an independent unit.

Concerning the more powerful Continental models, it may first be remarked that never before has there been so fine a display of Mercedes cars and chassis as on this occasion. Although not restricted even to the stalls of Messrs. J. E. Hutton, Messrs. Cannstatt-Mercedes and the Cannstatt Automobile Supply Association, yet these were the chief exhibitors. The last mentioned showed a 90-h.p. car, in addition to several of the 18-28-h.p. pattern, while Messrs. Hutton staged one of the few 70-h.p. chassis that have been built, in addition to complete vehicles of the latest 28-32-h.p. and 40-45-h.p. models. Messrs. Cannstatt-Mercedes had another of the 70-h.p. chassis, as well as 28-32-h.p. and 40-45-h.p. chassis and cars. Another chassis which is, in general respects, almost indistinguishable from the Mercedes make, and is moreover being sold at a considerably lower price, formed another of the many attractions of the Hutton stall, this being the 22-h.p. Berliet; the chief difference between its design and that of the Mercedes is that it has an expanding clutch.

The most important Panhard, De Dietrich, Mors, C.G.V., Pipe, Gobron, and Germain exhibits were naturally practically the same as at the Paris Salon. The Panhard firm again showed their new 50-h.p. chassis, which is of the side-chain type, and has a multiple disc main-clutch; the new 40-h.p. De Dietrich chassis, of which we then gave particulars, was exhibited by Messrs. Jarrott and Letts; the latest Pipe model, the engine of which has its valves arranged diagonally—and the clutch on which is of the scroll type—was shown by the London Motor Garage Company, who also exhibited the 18-h.p. C.G.V. chassis, which, it will be remembered, has a frame built up of ash-lined square-tubing, and has helical gear-wheels between the lay-shaft and the "through-shaft" in the gear-box. The 35-h.p. Gobron-Brillié chassis



AT OLYMPIA.—The new 20-h.p. Lanchester Car, fitted with special town body, built by the Lacre Motor Car Company. The narrow bonnet that covers the 4-cylinder vertical engine—which is placed longitudinally between the dashboard and the front seat—is clearly visible in our illustration.



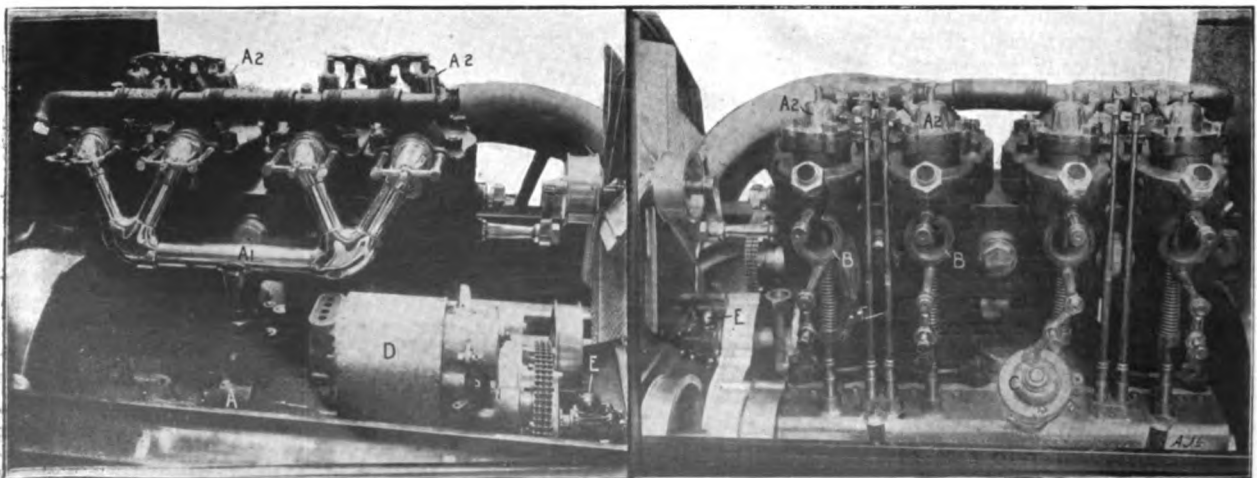
AT OLYMPIA.—View of the new 4-cylinder 20-25-h.p. Ariel Chassis from above, with the covers above the differential gear and the change-speed mechanism removed. The chief features of this first-rate English vehicle were given by us last week.

has a double clutch, with an inner metal cone and an outer leather-lined cone, was the chief exhibit of the Gobron Motor Company; and Capt. Masui showed the same 24-32-h.p. Germain chassis, the engine of which has steel cylinders with copper jackets.

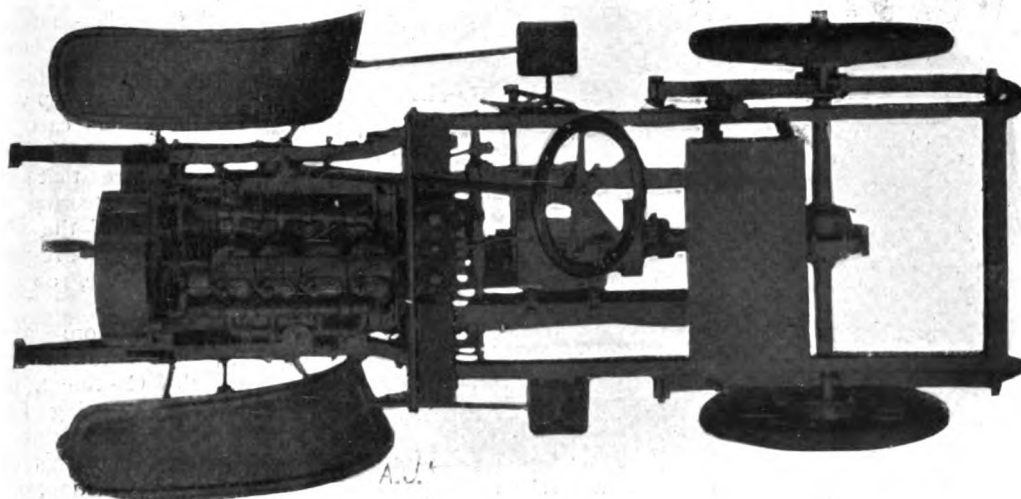
On this occasion, the 40-h.p. Delaunay-Belleville chassis, which—as the first automobile exhibit of a well-known Continental firm of engineers—created such a sensation at the Salon, was shown by the Burlington Carriage Company, who were also able to introduce to the notice of the public the Hermes-Simplex car that is built by Mathis and Co., of Strasburg, under license from Mons. E. Bugatti. The Delaunay-Belleville model is of extremely substantial construction throughout, and is of the chain-driven type; the actual machine on view had a 40-h.p. engine, the governor on which acts upon the exhaust-valve, as well as upon the inlet, and it also automatically varies the time of ignition. The Hermes car is also of the chain-driven type, and the engine is nominally of 40-h.p. The four cylinders, which are cast in pairs, have a bore and stroke of 136 mm. and 146 mm., respectively, and we were told by Mons. Bugatti that

it develops 58-b.h.p. at 1,000 revs. per min. This vehicle differs in so many ways from ordinary practice, that it is impossible to say more at the moment than that it has:—a main-clutch of the single-disc type, a novel type of steering-gear, radius-rods that are hinged sideways as well as in the usual direction, and small rollers instead of shackles between the rear ends of the back-springs and the dumb-irons that carry them.

The Martini models (shown by Captain Deasy), as also the Locomotrice and those of the parent company—Messrs. Rochet-Schneider—(exhibited by Messrs. Donne and Willans) are all similar in general design of construction, and were, it will be remembered, prominent in Paris; while the English Fiat Company make—with their 16-24-h.p. and 40-45-h.p. vehicles—an even better show than did the same makers over there; a 16-h.p. landaulette of this type has its body hinged at the back, as on the English Daimlers, so that it can be lifted up when it is necessary to get at the transmission mechanism. Another type of car, which—like the Fiat—is built in Italy, was also on view at the Exhibition, this being the 24-36-h.p. Itala. This chassis is of the live-axle type with ball-



AT OLYMPIA.—Views from the right and left side of the new 4-cylinder Ariel engine, the water-jacketed cylinders for which are formed by a single casting, though each cylinder has a separate water-jacketed head. The inlet-valves, A^2 , are fitted above the exhaust-valves, B , and the carburettor, A , is mounted on the other side of the engine, with the branched induction-pipe, A^1 , above it. The commutator, C , is extremely accessible, as also are the high-tension magneto, D , and the governor, E .

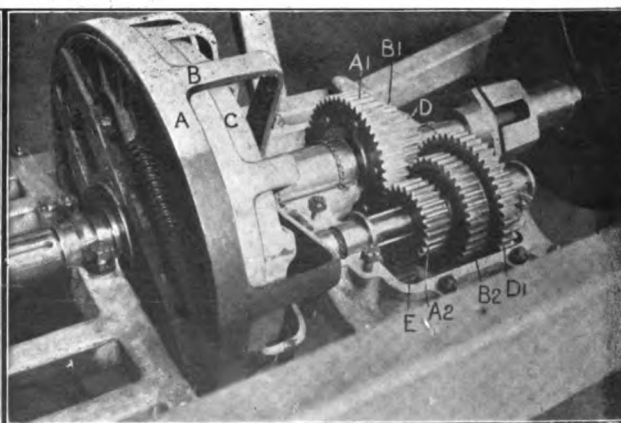
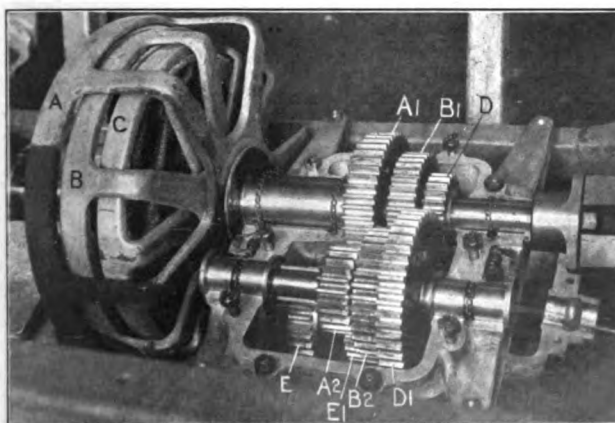


AT OLYMPIA.—View of the Hutton Light Car Chassis from above, showing the positions of the 4-cylinder engine and of the transmission gear.

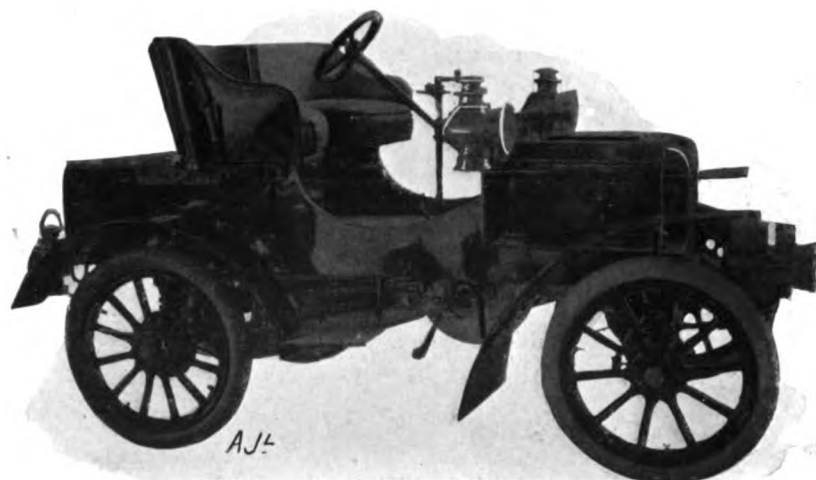
bearings arranged throughout the transmission-gear, and it has a special form of multiple-disc clutch in which there are twenty discs carried by each of the two members. The 4-cylinder engine has—very neatly arranged—its low-tension igniters placed above the inlet-valves, on the opposite side to the exhaust-valves, and has hollow camshafts through which pass two rods that control half-compression cams on the one shaft, and the “time of ignition” on the other side. The chassis is of first-rate design and workmanship throughout, and is one of three models that are now being turned out from the factory; the other two are similar in general respects, but are of 18–24-h.p. and 50–75-h.p. respectively.

Several of the well-known Hotchkiss cars were shown, including the same 17–25-h.p. chassis that was previously exhibited by Captain Corbet (on behalf of the London and Parisian Motor Company) at the Crystal Palace Show, recently. Among its many special features are the radiator (which is built up of triangular tubes), the

low-tension igniters (which have a particularly neat “trip” mechanism), and the mechanical lubricator, which is driven by an eccentric on the cam-shaft. The Mann and Overton exhibit included a 16–20-h.p. Richard-Brasier chassis, but the chief novelty was the twin-cylinder “Unic” car that is being specially built for them by Geo. Richard and Co.—who are now quite a distinct firm of makers. This is a thoroughly up-to-date, 4-seated vehicle, which is being put on the market at a very reasonable price, and in which accessibility of all parts has been specially studied. The cylinders are formed by a single casting, the bore and stroke are 100 and 110 respectively, the power available is about 13-b.h.p. at 1,000 revs. per min., and the wheel-base is either 6 ft. 2 ins. or 7 ft. 10 ins., according to requirements. It is of the live-axle type, has a gear-driven pump, low-tension magneto ignition, and the engine and the gear-box are completely enclosed on the under side.



AT OLYMPIA.—Two views of the change-speed-gear on the Brush Motor Bus, which has the three independent friction clutches, A, B and C, of the expanding type to introduce either of the three forward speeds alternatively; the clutch, A, locks the wheel, A¹, to the driven shaft, so that the power is then transmitted through the wheels, D, D¹, A² and A¹; the clutch, B, locks the wheel, B¹, to the driven shaft, and the clutch, C, gives a direct-through-drive. For the reverse, the wheels, A¹ and A², are separated and the wheel E introduced between them.



AT OLYMPIA.—The 7-h.p. Chambers' Light Car, with its third—middle—seat, exhibited by Messrs. Alford and Alder.

Of other well-known Continental vehicles exhibited, the Clement cars, for which Mr. E. H. Lancaster is the English agent, the De Dion vehicles, and the latest Gladiator models have all been well represented at the Show, but in view of the recent descriptions of them that have been given in our columns, it is unnecessary to more than record their presence there. The same remark practically applies to the "Aries" and to the "Dixi" cars, for we described the chief features of the former (which was exhibited by the Automobilia Co) in our Paris Salon report, and the Dixi larger models in a special article in September and October last. The "Aries" rear-axle is one of its special features, since it is not of the usual live-type although it is driven by a propeller-shaft; the Dixi tubular frame is, as we pointed out, a particularly fine sample of workmanship. Messrs. Laurie and Marner exhibited the new 4-cylinder 15-18-h.p. Chenard-Walcker car, on which the engine is cooled by natural circulation, and which has this maker's special double back-axle; Messrs. McNeil, Hutchinson and Co. showed Cottreau cars of 8, 12, 18 and 24-h.p.; the Victoria Carriage Works had Bollée vehicles of 40 and 24-h.p., and the firms of Renault, Darracq, and Clement-Talbot were as usual well represented.

A Belgian make of car—the "Metallurgique"—which is new to the British public, and is made in two twin-cylinder sizes of 8 and 12-h.p., and four 4-cylinder sizes of 12, 16, 24, and 30-h.p., was exhibited by the Institute of Chauffeurs, who showed a 16-h.p. chassis, and a 24-h.p. complete car. These vehicles are of the live-axle type, and have the "spring-drive" device, which



Most people, on making extended tours, have been often troubled to know the names of the villages through which they pass. Every village in England looks upon itself more or less as the centre of the universe and cannot by any means be made to believe that its name is not universally celebrated. Often enough if one asks the inhabitants the name, one receives no answer, and at night there are no inhabitants about even to ask. A correspondent of the *Daily Mail* is, therefore, well advised in making the sensible suggestion that a sign-post should be erected either on or near the lamp-posts (if any) of our villages so as to enable motorists to ascertain their whereabouts readily when on tour.

was to be seen on the Gillet-Forest stall at the Paris Exhibition; it is introduced between the propeller-shaft and the short shaft that carries the bevel-pinion in the live-axle-casing. The main clutch is of the expanding type, the engines have their cylinders cast in pairs, and the inlet-valves are provided with a variable-lift device that is controlled from above the steering wheel. The bore and stroke of the 16-h.p. engine are 95 and 110 mm., respectively, and, of the 24-h.p. engine, 100 and 150 mm., respectively.

Considerably more attention has evidently been bestowed in this country, than on the Continent, in attempting to supply cars having four or more cylinders at a really low price. Amongst those coming under this category, and of English construction, may be mentioned the Hutton light car, of which

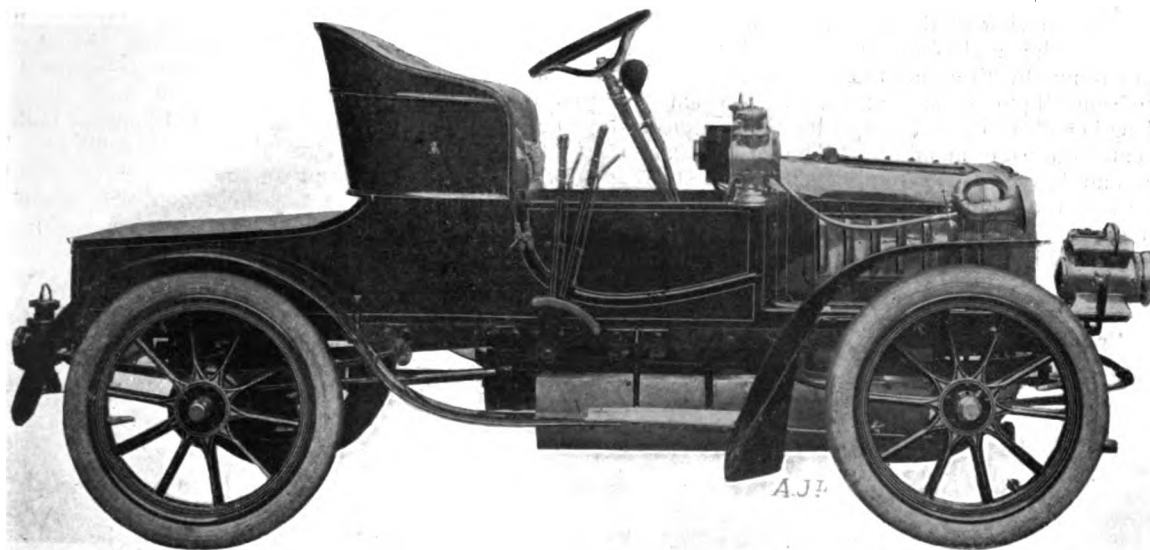
we gave a description in our last, the 12-h.p. Swift model, which is fitted with one of the extremely neat White and Poppe engines, the 8-10-h.p. Humber, the 12-14-h.p. 4-cylinder and the 18-20-h.p. 6-cylinder, Standard types and the 18-20-h.p. Vulcan—which is built in Southport. The 14-h.p. Hutton light car is now also made with a lengthened wheel-base for bodies such as that illustrated by us in our last issue, so that it can now be supplied either with a short wheel-base as a two-seater or with a long wheel-base as a four-seater. The construction of the 12-h.p. Swift vehicle, which is quite one of the cheapest machines of its type now on the market, is described on another page this week, as also are the two "Standard" light cars. The small 4-cylinder Humber has separate cylinders, with valves on opposite sides, and a bore and stroke of 77 and 108 mm. respectively. The chassis is of the live-axle type, and the car, like its larger (16-20-h.p.) sister—which is also a new 1905 model of similar general construction—is given a distinctive appearance by the hood, that slopes upward and rearward from the dashboard, and forms a partial protection both to the fittings on the dash and to the occupants of the front seat. One Continental car, at least, should be included in this same category of low-priced vehicles having 4-cylinder engines, this being the 14-h.p. "Minerva," which has already been referred to previously, and is another remarkable production considering its price. The 16-h.p. 4-cylinder Prosper-Lambert car is another Continental instance to which the same remarks apply.

(To be continued.)



THE Austrian Minister of War is organising a corps of automobile volunteers to be attached to the Landsturm. The Corps is to be divided into three groups of (1) officers carrying orders, (2) drivers for manoeuvres in time of peace, and (3) members undertaking to supply automobiles to the army in time of war. During manoeuvres the automobile volunteers are to be attached to the Army Service Corps and the first group will be specially instructed to transport orders of officers and generals and members of their staffs. The Landsturm, it will be remembered, is the last reserve of the Austrian and German armies.

THE SWIFT PETROL CARS.



A 7-h.p. Swift Car. This particular vehicle has the standard Twin-Cylinder Chassis, but is fitted with a special Body and Bonnet.

ALTHOUGH the two new types of vehicle which the Swift Company are introducing this year, differ in several respects from the very excellent little cars which did so well during last season, yet—in the main—they are designed on the same lines. They include a 7-h.p. model, which has a twin-cylinder engine and is fitted with a two-seated body, and a 4-cylinder 12-h.p. car that has seating accommodation for four persons. They both have pressed steel main frames, with either angle or channel underframes for supporting the engine and the gear-box, but the larger car has a 7-ft. wheel base as against 6 ft. 6 in. on the smaller, and his 32 ins. by 3½ ins. tyres, instead of those of 28 ins. by 3 in.; the track in both cases is 3 ft. 10½ ins.

The whole of these vehicles are built in the maker's own works at Coventry, with the exception of the engines, and even these are produced in the same town—by Messrs. White and Poppe. For the purposes of turning their cars out in large quantities, and therefore at a low price, the Swift works have been very greatly increased in size since our previous visit, and are now installed with a very excellent equipment of up-to-date machinery for ensuring interchangeability of parts, and first-rate workmanship. Both models are of the live-axle type, and closely resemble one another, so that the description which we are able to give of the smaller one applies to a great extent also to the larger car.

One of the 7-h.p. cars which, however, was fitted with

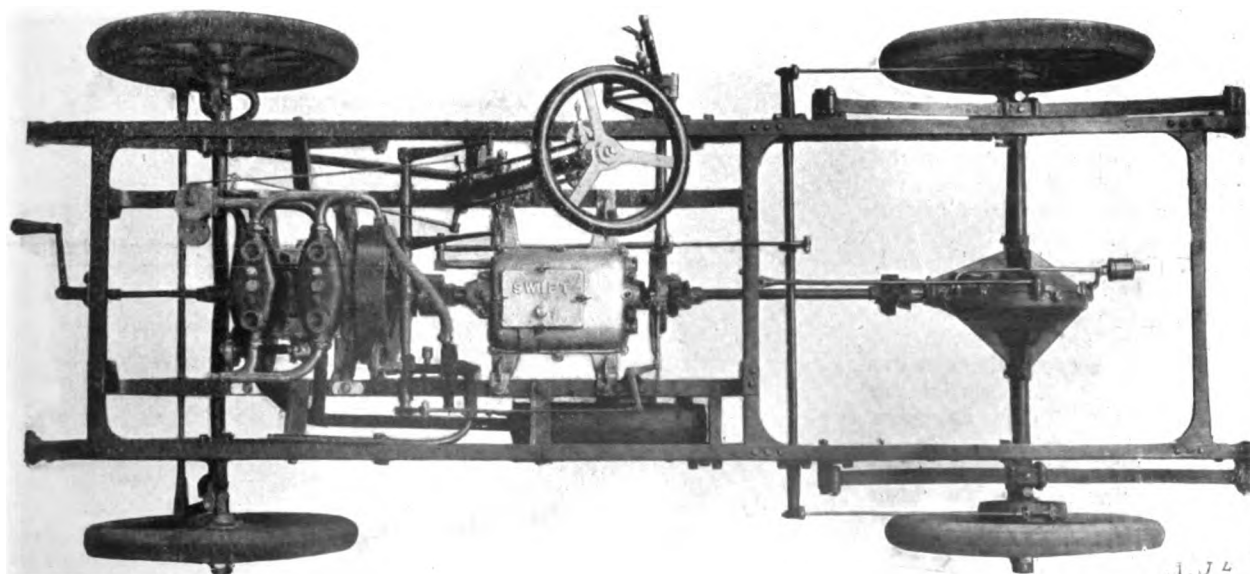


Fig. 1.—View of the Twin-Cylinder 7-h.p. Swift Chassis, from above.

a special body and bonnet—and is therefore not quite standard—is shown in our first illustration, and in Fig. 1 we give a view of the chassis from above. As will be seen, the underframe is rendered rigid with the main frame by three additional stays at each side, and the semi-elliptic springs at the back—which have been lengthened since last year—lie outside instead of beneath the side members. The front axle is tubular, and has bifurcated ends to form the steering heads, while the front wheels—like the live-rear axle—are mounted on ball bearings. The steering gear is securely fixed both to the underframe and to the main

frame, and is of the worm and segment type, with a phosphor-bronze segment. At the top of the steering pillar is an adjustable ball bearing for taking up any back-lash, and, at the bottom, the thrust is taken by a hardened steel collar. The back axle is connected with the frame by radius rods at each side, as well as by a central torque-rod, and the universal joints at both ends of the propeller-shaft have their pins carefully hardened. The axle itself is stayed on the underside, and, inside the casing containing the differential-gear, there is an end bearing for supporting the short longitudinal shaft on the other side of the bevel-pinion.

(To be continued.)



THE NEW 8-H.P. WOLSELEY CAR.

(Concluded from p. 220.)

THE engine, removed from the chassis, is shown from two different points of view in Fig. 7—the first view showing it from the right side, and the other from the front, looking at the cylinder-heads. Its construction is rendered still more clear in Fig. 8, which shows some of the more important parts grouped separately.

The crank-chamber, B, is a single aluminium casting, which has a large detachable lid, B¹, above the crank-shaft, and forms the jackets for the two cylinders. The cylinders themselves are constituted by cast-iron liners, B⁴, which fit tightly into the aluminium casting, B, and are forced into place. The cylinder-heads, B⁵, are separate water-jacketed castings for each cylinder, and they fit, with a conical metal-to-metal joint, up against the cylinder-liners, each of them being held in place by four studs, as seen in Fig. 7. The castings, B⁵—two views of which are included in Fig. 8—form the valve-chambers at the back ends of the cylinders, the exhaust-valves being placed vertically immediately below the inlet-valves, and the ignition-plugs screwing into the central holes, D², at the extreme ends. The inlet-valves have removable seatings, B⁶, and thus they act as inspection covers for the exhaust-valves, while they are themselves held down in place by the induction-pipe-casting, C², as shown in Fig. 7. The two bearings for the crank-shaft, F⁴, are formed in the walls of the main casting, B, and for this purpose—and in order to enable the brasses to be adjusted—there are detachable bearing-blocks, B², that fit into corresponding slots in the casting. Each of these bearing-blocks is held down by a pair of studs that pass through it. The crank-shaft is a solid forging, and, as seen in Fig. 8, it has a flange to which the flywheel is bolted. The two crank-pins are in line with one another, and between them is the crank-check, F⁴, that carries the counter-weight, F⁶, for balancing them.

The precise arrangement and shape of this weight has been determined by long and careful experiment, and are now of such a character as to ensure extremely smooth running of the

engine over an extremely wide range of speed. The crank-shaft projects sufficiently far beyond the flywheel, F, to carry the “driven” portion of the main-clutch, together with its clutch-spring, and, at the other end, it is fitted with a spur-wheel (inside the main-bearing) and with the coupling for the starting handle (outside it). The spur-wheel drives the cam-shaft, A⁶, which lies immediately beneath the crank-shaft, and, mounted upon this cam-shaft are the two exhaust-cams, as well as sliding-cams to give the half compression. The cam-shaft, at the one end, projects through the casting, B, in order that it may drive the circulating-pump, E.

The exhaust valves have stirrups, A³, fixed to the ends of the valve spindles, and, engaging with these stirrups, are the flat leaf springs, A⁴, that normally hold the valves on their seats, and the pivoted levers that operate the valves. The operating levers are carried on the short, stationary shaft, A⁵, which is in turn mounted in the brackets, B³, that form a part of the casting, B. The inner ends of the pivoted levers are fitted with rollers that ride beneath the exhaust cams,

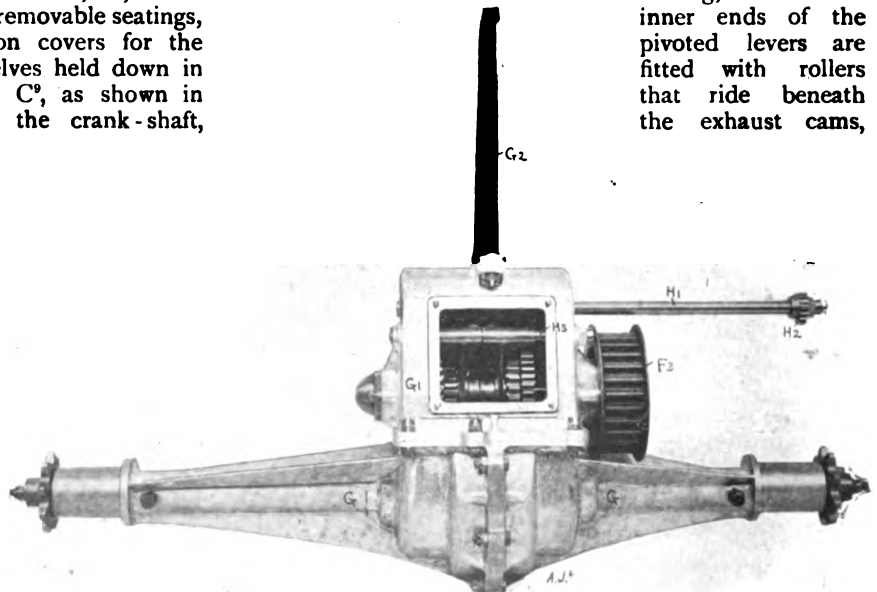


Fig. 5.—The 8-h.p. Wolseley Chassis. View of the combined Gear-Box and Differential Countershaft, which form a single unit, that is fixed adjustably for tightening the Driving Chain, and with a Three-Point Suspension, to the Main-Frame.

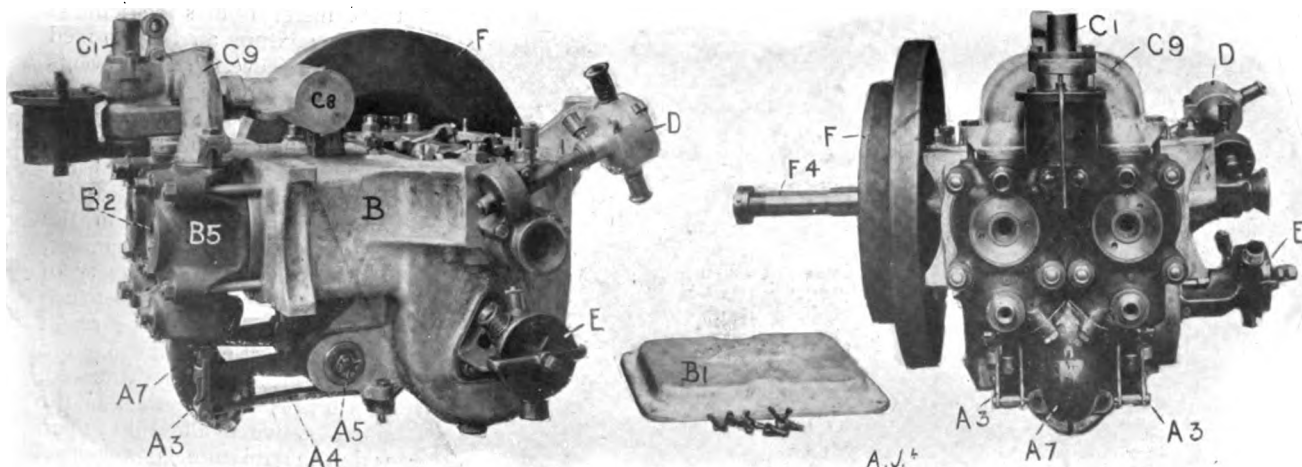


Fig. 7.—Two views of the 8-h.p. Wolseley Engine, complete with its Carburettor, Commutator and Circulating-Pump.

and thus the valves are actuated in the required manner. A common exhaust-pipe fitting, A¹, is bolted to both the cylinder-head castings, B², so that the burnt gases from both cylinders are led into the same exhaust-pipe.

The commutator, D, is fitted diagonally to the crank-chamber, as seen in Fig. 7, and is driven by enclosed skew gearing from the crank-shaft. It is thus rendered extremely accessible when in place on the car; it is of the "wipe" type, has a large hinged cover, and is used in conjunction with two trembler coils. The circulating pump, E, which is of that type in which sliding vanes are carried by a revolving eccentric drum inside a

cylindrical casing, is also conveniently placed, and has a cover plate which can be removed by slackening a single nut. The pump forces the water through the jackets in the two head-castings, B², and through the jacket formed by the casting, B, these jackets being connected together by external pipes.

One of the pistons, B⁷, fitted with its connecting-rod, B⁸, is shown in Fig. 8, where it will be noticed that it has three piston rings. The "big-end" of the connecting-rod can be adjusted through the inspection-cover, B¹, or the piston and the rod can even be removed through this opening if required. A special feature of the piston is

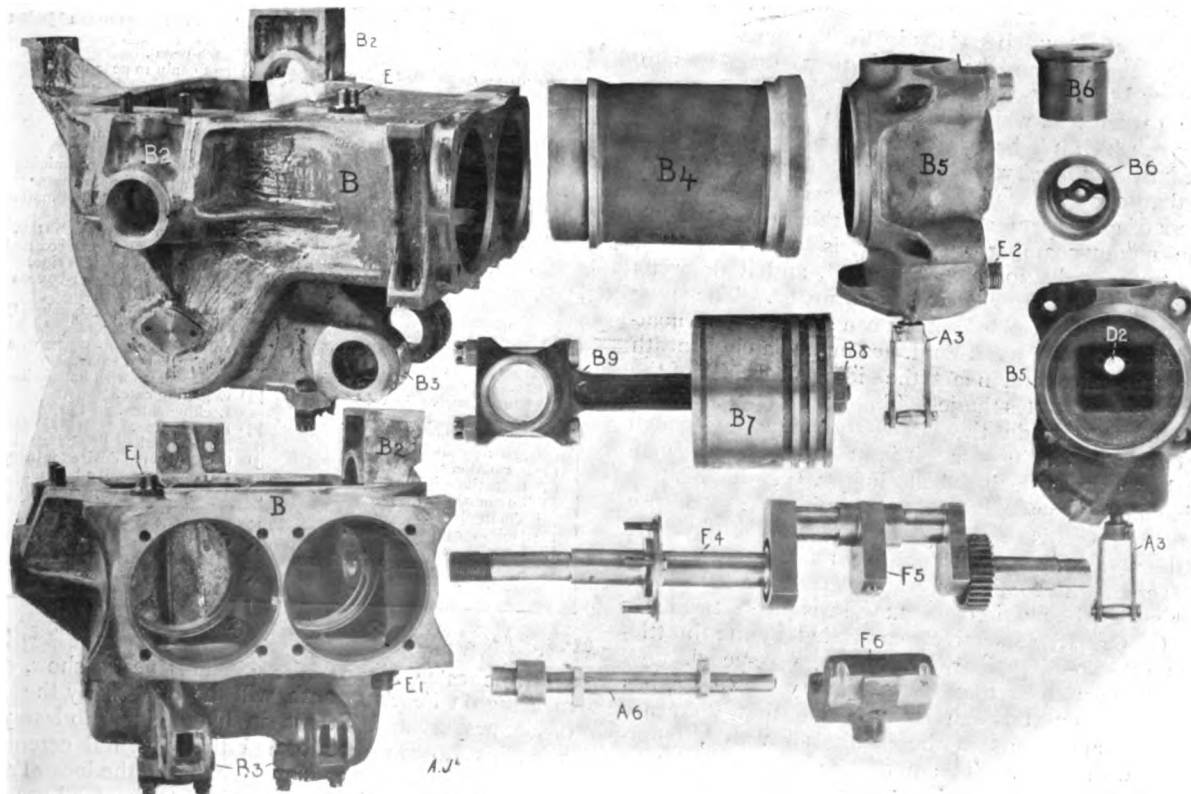


Fig. 8.—Some of the most important component parts of the 8-h.p. Wolseley Engine, showing the method of its construction.

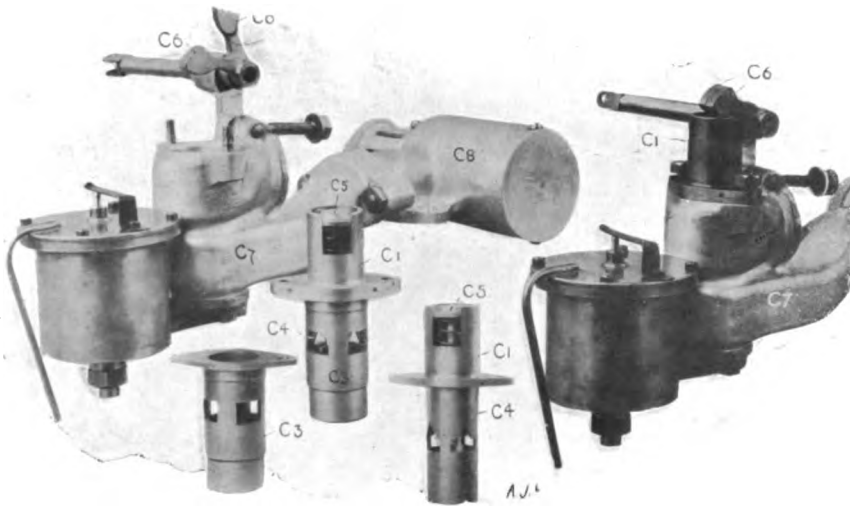


Fig. 9.—The Wolseley Combined Carburettor and Throttle-Valve, showing the complete apparatus with the entire Throttle-Valve lying alongside, the Throttle-Valve taken apart, and a portion of the Carburettor with the Throttle-Valve fitted in place.

that the gudgeon-pin is carried by two bearing-brackets which are secured to the piston by nuts, B⁸—outside its end—instead of fitting it through the wall of the piston in the usual way. By this arrangement, the piston can be machined over its entire surface, inside as well as outside, and since the metal can therefore be made of an equal thickness all round, there is no risk of its becoming distorted when hot. This construction—as also the method of forming the cylinders and the cylinder-heads—have always been distinctive features of the Wolseley engines, and have many great advantages to recommend them.

The carburettor, which is shown in Fig. 9, is of the new type, which has been adopted on all the latest cars, and it has, combined with it, a special form of throttle-valve that tends to maintain an approximately constant richness of mixture under ordinary working conditions.

The mixing-chamber casting, C⁷, is, it will be seen, bolted to the induction-pipe fitting, C⁹, and it draws its supply of air from the silencing air-bottle, C⁸. The spray jet, in which the petrol is kept at a constant level by a float-feed device of the usual kind, lies immediately beneath the throttle-valve, and, in fact, the sliding-sleeve, C⁴, of the throttle-valve encircles the jet. This sliding portion forms a piston-valve inside the stationary sleeve, C³—which also encircles the jet—and it is at its upper end connected by a rod with the small plunger, C⁵, which is free to slide in the upwardly projecting guide, C¹. Beneath the piston, C⁵, is a spring that normally holds the throttle-valve wide open, but above it are mounted the two lever arms, C⁶, either of which can be made to close the valve to the required extent. It is these two lever arms, C⁶, that are respectively controlled by the throttle-lever on the steering-pillar, and by the brake-pedal.

It will be noticed that the stationary sleeve, C³, has square ports cut through its wall, and that there are curiously shaped ports in the sliding sleeve, C⁴, to correspond with them. The ports are so arranged that they allow no air to enter through them when the throttle-valve is shut, but they permit an ever-increasing amount to enter as the throttle-valve is opened wider and wider. The air entering through them, from the air-bottle, C⁸, does not pass around the spray-jet, so

that it merely dilutes the richness of the mixture already formed inside the sleeve, C⁴, and prevents an abnormally high degree of suction from being created in the mixing-chamber. Simultaneously with opening these auxiliary air ports, the sleeve, C⁴, increases its distance from the base of the mixing-chamber, and so reduces the velocity of the air that passes up between it and the jet, with the result that the injection action exerted on the petrol is thereby decreased. It will thus be seen that, as the throttle-valve is allowed to open wider, the mixture is prevented from increasing in richness unduly, but that when the throttle-valve is nearly closed the small amount of air that does enter is able to take up sufficient petrol to carburate it properly. An adjustable valve is fitted for

regulating the amount of air that can enter the air-bottle, C⁸, and thus a permanent adjustment is available, by which climatic changes, or different grades of petrol, can be compensated for.

The engine has a 4-in. bore and a 4-in. stroke, and it is capable of giving about 9-b.h.p. at 900 revs. per min.

Table of Reference Letters for the 8-h.p. Wolseley Car Illustrations.

A	Slipper guides for side-springs.	F ²	Pipe connections to head jacket
A ¹	Exhaust-pipe.	F ³	Clutch flywheel.
A ²	Exhaust-box.	F ⁴	Clutch-pedal.
A ³	Stirrups on exhaust-valves.	F ⁵	Silent chain to gear-box.
A ⁴	Leaf springs for same.	F ⁶	Chain-wheel on first-motion-shaft.
A ⁵	Shaft carrying rock-levers.	F ⁷	Crank-shaft.
A ⁶	Cam-shaft.	F ⁸	Cheek between crank-pins.
A ⁷	Exhaust-pipe fitting.	F ⁹	Counter-weight.
B	Crank-chamber and jacket casting.	G	Gear-box castings, containing differential countershaft.
B ¹	Cover for same.	G ¹	Casting containing first-motion-shaft.
B ²	Detachable bearing caps.	G ²	Longitudinal suspension stay.
B ³	Lugs for rock-lever shaft.	G ³	Bracket carrying gear-box and hand-levers on right side.
B ⁴	Cast-iron liners.	G ⁴	Bracket carrying gear-box on left side.
B ⁵	Cylinder-head castings.	G ⁵	Set-screw acting on bracket, G ³ .
B ⁶	Inlet-valve seatings.	H	Change-speed-lever.
B ⁷	Piston.	H ¹	Shaft carrying operating cams.
B ⁸	Nuts behind piston.	H ²	Spur-wheel on same.
B ⁹	Connecting-rod.	H ³	Guide-sleeve for sliding forks.
C	Carburettor.	H ⁴	Engaging catch.
C ¹	Guide-sleeve for throttle-valve.	H ⁵	Locking catch.
C ²	Throttle-lever.	H ⁶	Press button.
C ³	Lower guide for throttle-valve.	J	Brake-pedal.
C ⁴	Throttle-valve sleeve.	J ¹	Compensating device for internal expanding brakes.
C ⁵	Head of valve sleeve.	J ²	Rock-shaft for expanding brakes.
C ⁶	Levers acting on C ⁵ .	K	Brake-lever.
C ⁷	Mixing chamber casting.	K ¹	Compensating device for external brakes.
C ⁸	Air bottle.	K ²	Rock-shaft for same.
C ⁹	Induction-pipe fitting.		
D	Commutator.		
D ¹	Timing lever.		
D ²	Holes for ignition plugs.		
E	Circulating pump.		
E ¹	Pipe connections to aluminium jacket.		



Manchester Motor Show.—This year's show, commencing on February 24th, will be opened by the Earl of Shrewsbury and Talbot, in like manner to last year, when his Lordship performed the inaugural ceremony. This show is under the management of the local Trades Association, and this year promises to beat all previous records. All space has been allotted some time ago, and we understand that had twice the area been available the committee could easily have disposed of it.

INDEX
THE 1905 DAIMLER CARS.
(Continued from page 222.)

The Engine.

THE engine is shown in place on the chassis, from the "near" side, in Fig. 1, and is also illustrated separately in Figs. 6, 7 and 8. As will be seen, the cylinders are cast in pairs, with the valve-chambers and the connecting ports for the induction-pipe, A^1 , the exhaust-pipes, L^2 , and the water-pipe on the left side only. The valves all lie parallel with one another, but are set at an angle from the vertical, and thus the surface area of the combustion-chambers is materially reduced, while at the same time the valve-seatings are more effectively water-jacketed, and the valves are more readily accessible for grinding in. Above each valve is the usual inspection plug, and, as will be seen in Fig. 5, the high-tension ignition-plugs, C^1 , are fitted into those above the inlets. The top of the water-jackets, above the cylinder-heads, are formed by large detachable covers, to the centre of which the return pipe to the radiator is connected. The cylinders, as we have already said, have a bore of 110 mm. and a stroke of 150 mm.

The valves, which are interchangeable, are of large

size, and are operated from a cam-shaft, which lies outside the crank-chamber, and is driven by large fibre and metal wheels, as seen in Fig. 7. The cams do not act direct upon the valve spindles, but there are small pivoted levers introduced between them, these levers having rollers that ride on the cams. At the front end of the cam-shaft is an oil-tight casing, C^3 , that contains the gear-wheels, by which the vertical spindle, carrying the combined commutator and distributor, C , is driven. The vertical spindle itself passes up through a sleeve, which is normally stationary, and this is connected by the rod, C^4 , with the throttle-valve on the carburettor, in such a way that the "time" of ignition is varied in accordance with the adjustment of that valve. The combined commutator and

distributor is of very substantial, though neat, construction, and enables a single trembler coil to be employed for the four cylinders—with the further result that absolute synchronism between cylinder and cylinder is assured.

Although the standard vehicles are fitted with this high-tension system, in which batteries are employed for

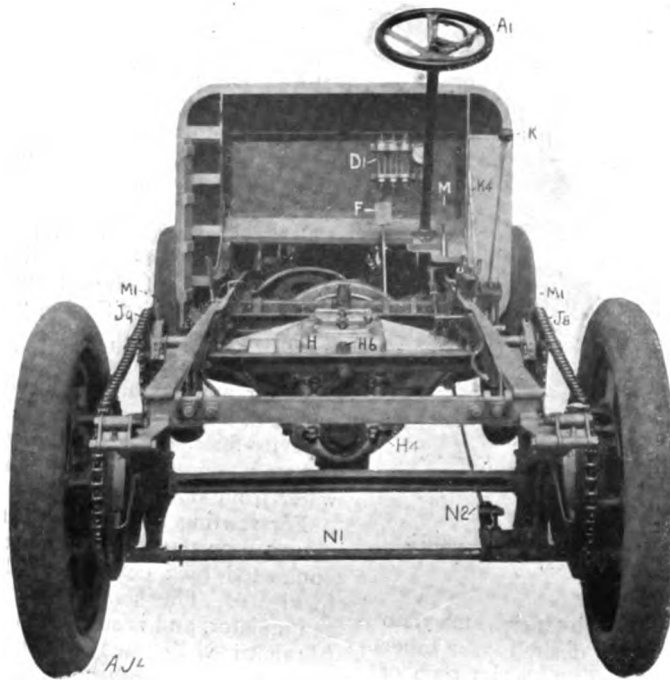
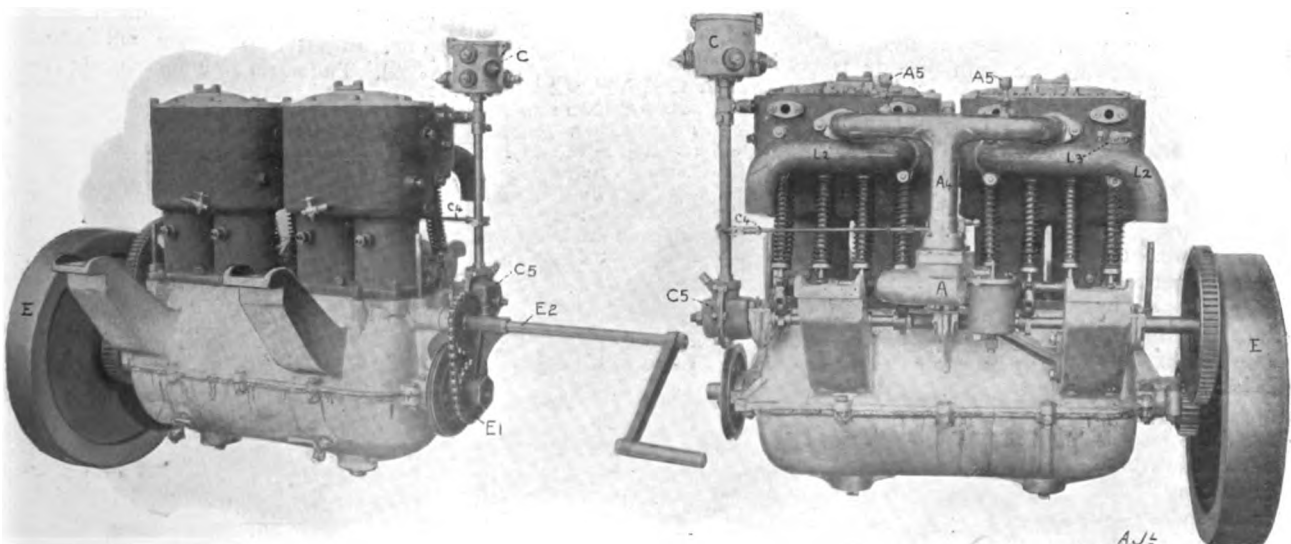


Fig. 3.—Rear view of the 28-36-h.p. Daimler Chassis, with the Petrol Tank removed to show the Rear Axle, the Brake Mechanism, and the Gear-box.



Figs. 6 and 7.—The 28-36-h.p. Daimler Engine, from the right and left hand sides, respectively.

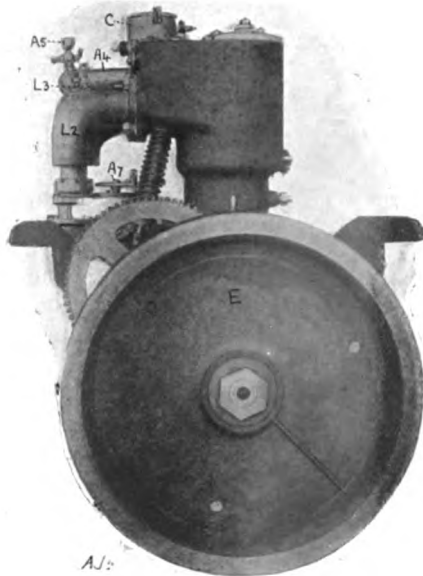


Fig. 8.—Rear View of the 28-36-h.p. Daimler Engine, showing the inclined valves.

giving the necessary current, yet a high-tension magneto can be fitted as well—or instead—if desired. In other cases, the company are prepared to fit a special type of dynamo to automatically recharge the accumulators, when the engine is running, and this dynamo then also allows electric lights to be employed on the car. It is ingeniously constructed to maintain an approximately constant voltage, when running, for which purpose both the armature and the field magnets are capable of rotating; the latter are driven by a belt or other means from the engine, and the former has a brake-drum secured to it, and a brake-band that only allows it to slip when the torque exceeds a given amount. By adjusting the tension of the brake-band, the amount of slip, in relationship to the load, can be adjusted, and thus the dynamo can be used for charging accumulators, although the speed of the engine may be varying over a very wide range. In conjunction with this apparatus, an automatic "cut in" and "cut out" is employed, for switching "on" when a certain voltage is reached, and for switching "off" again when it again falls below that point. The crank-chamber is formed by two castings that are joined together with a horizontal joint between them, as seen in the illustration. The bearings are so carried by the upper casting that the base can be detached without disturbing the crank-shaft. All the bearings on the crank-shaft, including the "big-ends" of the connecting-

rods, have white-metal surfaces, and the crank-shaft, which is a solid forging of large diameter, is carefully balanced. The connecting-rods, which are hardened by a special process—largely employed also for other parts of this well-built car—have steel-bearing surfaces, to ride on the steel gudgeon-pins, at their upper ends, and a special feature of the pistons is that they have their four rings, which are fitted in pairs in two grooves only.

Referring to Fig. 5, it will be noticed that the circulating-pump, B, which is of the gear-wheel type, is driven by a chain, and that the fan, B², is connected with the crank-shaft by a belt in such a way that it can at all times be kept taut. The pump delivers the water in near the top of each cylinder—in the immediate neighbourhood of the exhaust-valves—and the jackets are so formed that, although the water passes out direct at the highest point, yet it effectively cools the entire castings. The radiator, B¹, is of neat and strong construction, and enables the tubes to be cleaned out or replaced, if necessary, at any time; it has a sufficient capacity for carrying all the water that is required, and it has a large enough cooling surface to prevent the water from boiling.

For starting the engine, a free-wheel sprocket, E¹, is mounted on the front end of the crank-shaft, and this is connected by a chain with the starting-handle, as seen in Fig. 6. The starting-handle itself projects through the radiator, and is supported in front of it by the cross-bar that is visible in our front view of this car. It will be noticed that neither the starting-handle nor the chain move, except when actually being used.

THE CARBURETTOR.

In Figs. 5, 7 and 8 the position of the carburettor alongside the engine, is well shown, while in Fig. 9 two separate views of it are given. The petrol is fed to it under pressure from the tank, A², at the back of the frame, the necessary pressure being obtained from the exhaust-gases issuing from the two rearmost cylinders; for this purpose, the pressure-valve, A³, is connected with the exhaust-pipe, L², by the flange-coupling, L³. The carburettor is of the float-feed type, and has an inspection-plug, A⁵, fitted immediately above the spray-jet, while the whole of the air that passes the jet is warmed by being taken from the neighbourhood of the rearmost exhaust-pipe, and it is only the auxiliary-air supply that is quite cold. The warm air enters through the

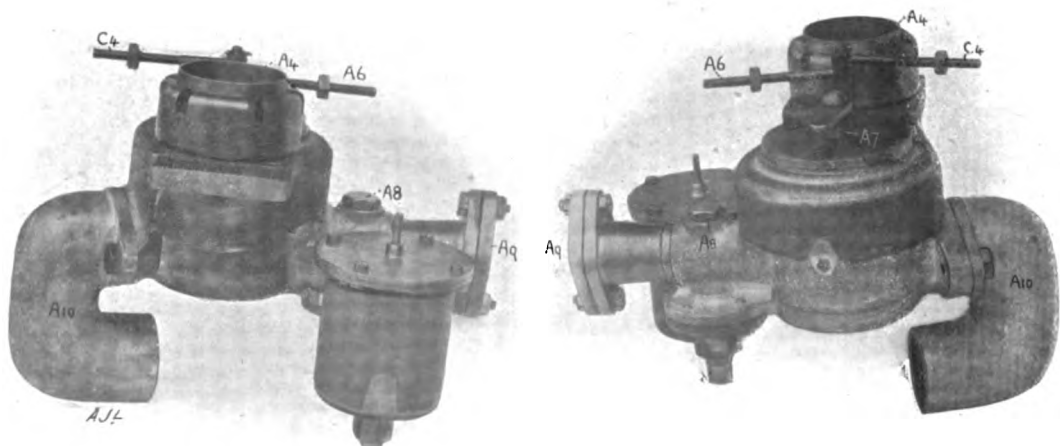


Fig. 9.—Two views of the Daimler Carburettor.

flange-fitting, A⁹, and the cold air through the pipe, A¹⁰. Between the mixing chamber and the induction pipe, A⁴, is introduced a specially-constructed valve that not only controls the passage of the mixture to the cylinders, but simultaneously regulates the warm and cold air passages; an approximately constant richness of mixture is thus at all times maintained. This compound piston valve is connected externally by its projecting spindle, A⁷, both with the rod, A⁶, that enables it to be adjusted from the hand-lever above the steering-wheel, and with the rod, C⁴, that "times" the ignition. In this way—without the employment of any automatic governor—the speed of the engine is entirely controlled from one

small lever in front of the driver, this simple device being, we learn, thoroughly satisfactory, and extremely convenient, in practice on these cars.

There is, however, one other adjustment furnished, by which any variations in climatic condition can be compensated for, or the engine can be set to suit different grades of fuel. This consists of small cocks, A⁵, which are fitted into the induction-pipe, so that a greater or a less amount of additional air can be allowed to enter direct to the cylinders; the cocks as a rule require no attention, and, therefore, no provision is made for adjusting them while the car is in motion.

(To be continued.)



THE 20-H.P. BROTHERHOOD PETROL CAR—PART IV.

The Ignition System.

In Fig. 15 the position of the high-tension ignition plugs, H, is well shown, and it will be noticed that they are screwed into small elbow fittings, which cause them to lie vertically, instead of being fitted direct into the cylinder castings. By this means, their upper and insulated terminals are conveniently placed for the chopper switches, H¹, to engage with them, these switches being fixed to the wooden casing that encloses all the high-tension conductors, and leads them from the dashboard across above the engine. The switches, H¹, not only permit either plug to be disconnected, but are also so arranged that there is no risk of the spark-coil being damaged, should one of the plugs have been left disconnected when the engine has been re-started. For this purpose there is a copper "bus-bar," H², fixed outside the wood casing, and this is connected electrically with the cylinder castings; the "bus-bar" is so placed that, as soon as either switch, H¹, is thrown off to more than a

safe sparking distance from the ignition-plug, the spark will be able to jump across to the "bus-bar" instead.

A single trembler-coil is used for all four cylinders, the combined distributor and commutator for operating it being fixed so that it projects through the dashboard to enable its glass front to be visible from the driver's seat. It is driven by a vertical shaft, having flexible couplings—and by spiral gear-wheels—from the rear end of the

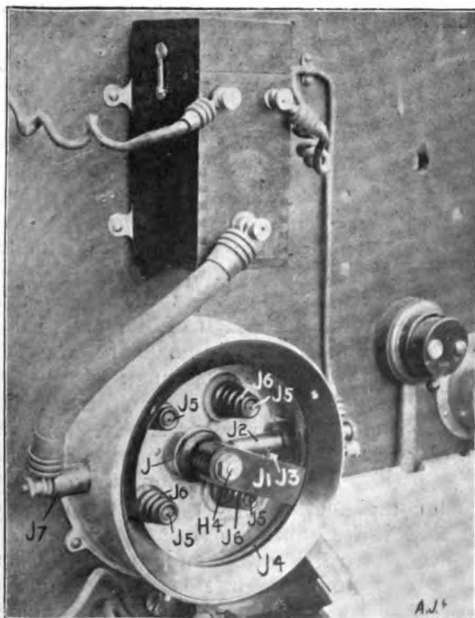


FIG. 18.—The combined Commutator and high-tension Distributor on the Brotherhood Car, shown fixed to the dashboard, with the Trembler Coil above it, and the Two-way Switch to the right of it.

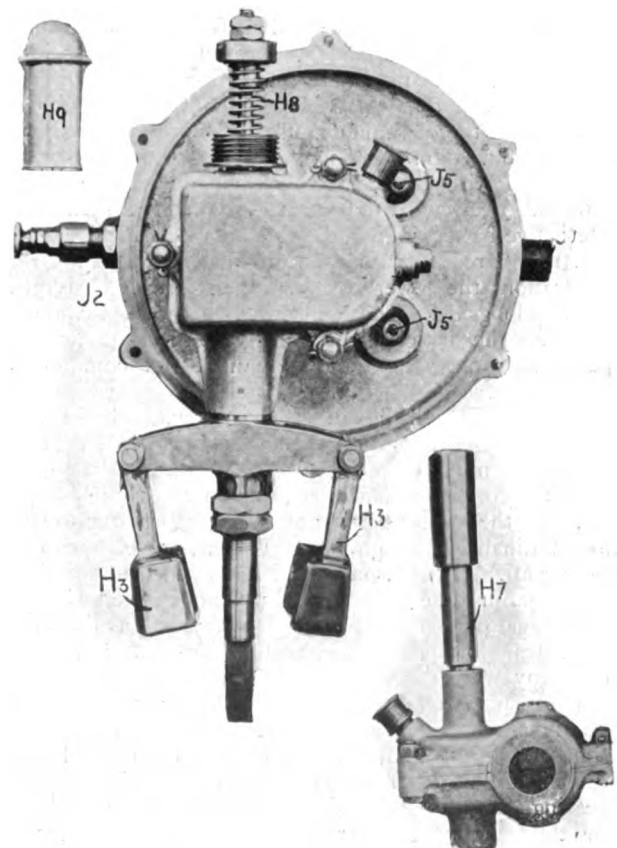


FIG. 19.—Rear View of the Brotherhood combined Commutator and Distributor, showing the mechanism by which it is driven, the Governor by which it is automatically "timed," and the adjustable Spring for the Governor; the cap that covers the Governor-spring is shown separately to the left, and the lower portion of the driving mechanism (that is mounted about the Cam-shaft) is seen on the right.

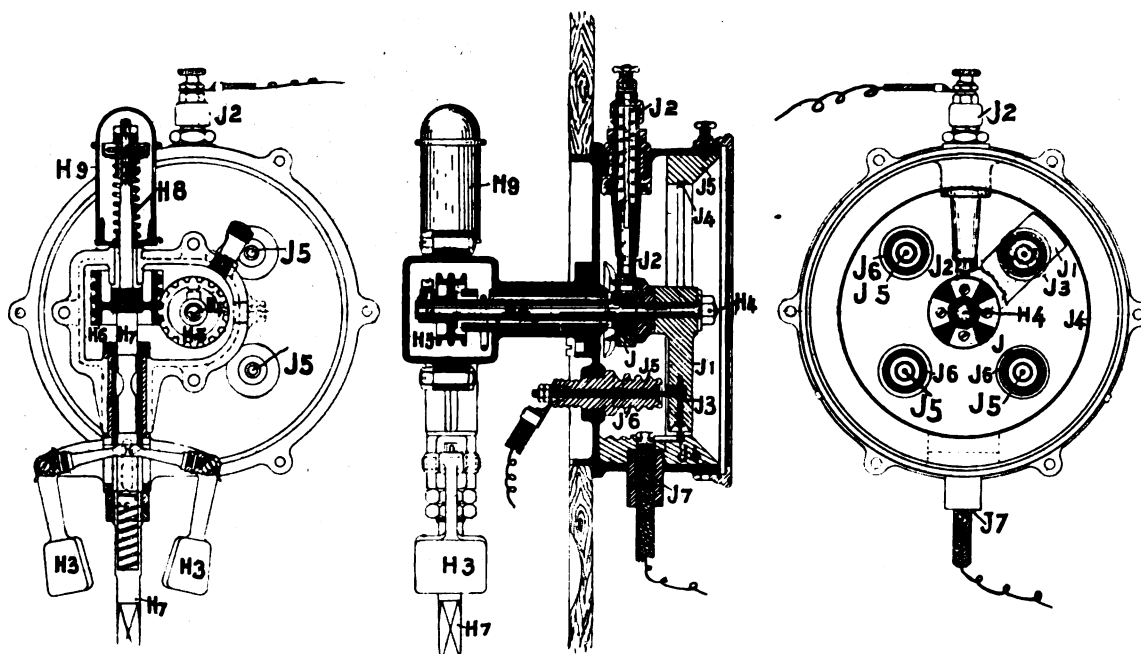


FIG. 20.—The Brotherhood combined Commutator and Distributor. Cross-section through the Governor-gear, longitudinal section through the Distributor itself, and cross-section through the low-tension portion of the apparatus.

exhaust-cam-shaft. The vertical shaft carries a centrifugal governor, H^8 , that automatically varies the time of ignition to suit the engine speed. The governor, and a portion of the mechanism that drives the commutator, is visible in Fig. 14, but the commutator itself is most clearly shown in Figs. 18 and 19. In Fig. 18, it is seen fixed to the dashboard, with the coil-box immediately above it, and with the two-way switch to the right of it; the two alternative batteries lie under the floor board beneath it. Fig. 19 is a rear view of the same apparatus, and, in this illustration, the lower part of the vertical shaft is also shown alongside. These illustrations, taken in conjunction with the sectional drawings given in Fig. 20, render particularly clear the construction of the commutator mechanism.

Passing through the aluminium casing, is the spindle, H^4 , which is driven by the spiral gear-wheel, H^5 , that is mounted on its extreme end. The wheel, H^5 , meshes with the corresponding wheel, H^6 , on the vertical shaft, H^7 , and the upper portion of this shaft is free to slide longitudinally, although it must always revolve with the lower part. It is normally held in its uppermost position by the adjustable spring, H^8 , but is connected with the centrifugal governor, H^3 , in such a way that, as the speed increases, the spiral gear-wheel, H^6 , is drawn down in company with the upper end of the shaft; the commutator-spindle, H^4 , is thus rotated to a certain extent in relationship to the shaft, H^7 . In this simple manner the time of ignition is varied, for the shaft, H^7 , is at all times driven through its flexible couplings—and similar spiral gearing—from the cam-shaft, and the gear is so set that the time of ignition is correct for starting the engine, when the wheel, H^6 , is in the vertical position shown in Fig. 20. The spring, H^8 , which is covered by the detachable cap, H^9 , is of just sufficient strength to allow the governor to slide the wheel, H^6 , downwards to the required extent for advancing the ignition to suit the speed, and it has, as will be seen, a couple of lock nuts by which it can, at any time, be easily adjusted. The lower spiral gear-wheels—

like the upper pair—are enclosed in a neat casing and run in oil.

Mounted on the spindle, H^4 , is the low-tension “commutator,” J , which is made of brass, and has four blocks of ebonite, secured in place by screws, to form insulating surfaces between its four equidistant contact faces, and, in front of this “commutator,” is the ebonite lever-arm, J^1 , which acts as the high-tension distributor. The low-tension brush, J^2 , passes through an insulating bush in the aluminium casing, and presses on the commutator in the usual way, the connections between it, the coil, and the battery being quite normal. The high-tension arm, J^1 , carries a metal portion, J^3 , that does not actually touch the metal ring, J^4 ,—which surrounds it—nor does it actually come in contact with either of the four terminals, J^5 , that it passes over; it comes, however, sufficiently near to both for the high-tension spark to jump across. The ring, J^4 , is embedded in an ebonite frame, J^5 , and the four terminals, J^6 , are mounted in ebonite bushes, J^6 , while the “live” high-tension wire is led direct from the coil to the terminal, J^7 , and this terminal is in direct electric connection with the ring, J^4 . When the distributing arm, J^1 , revolves, it allows the current to pass from the ring, J^4 , to each of the terminals, J^5 , in turn, and, since these four terminals are connected with the four ignition plugs on the engine, it causes the spark to occur in each cylinder at the required time.

When the engine is running slowly, quite a large number of sparks can be seen to jump across from the ring, J^4 , to the moving conductor, J^3 , each time the circuit is completed, but as the speed increases, the sparks become less and less in number until, at full speed—even when the battery and coil are working properly—there are only one or two sparks to be seen at these times. By watching these sparks, therefore, a very good idea can be obtained as to whether the coil is working quite properly or not, while should a fault arise at any time, in any part of the ignition system, the driver can at once see whether it is on the engine side, or on the

battery side, of the distributor. A defective plug, for instance, would not affect the regularity of the sparks inside the distributor, whereas a "run-down" battery would do so; in the former case one would consequently suspect the cause immediately, and would soon ascertain which plug was faulty by switching off each in turn. The Brotherhood distributor, in fact, affords every chance for locating "ignition troubles" quickly. The apparatus is, too, very strongly made, and very simple to understand, while a further useful feature possessed by it, is that each of its high-tension terminals is clearly marked with its own indicating number; the number denotes the cylinder that the terminal serves, and corresponds with a similar number on each of the switches above the ignition plugs.

The special feature of the induction-coil employed, is well illustrated in Fig. 21, where it will be seen that the trembler is mounted upon an ebonite base, which is held down in place upon the coil by a single screw only; it can thus be removed complete for examination, or can be entirely replaced at a few moments notice. The windings, together with the core and the condenser, also form an independent unit that can easily be slid up out of the coil-box, should it at any time give trouble. The necessary contacts are either made by internal sliding strips of metal, or by the screws that lock the parts in place, so that there is no need to disconnect any wires when taking out the inner members. The coil itself has

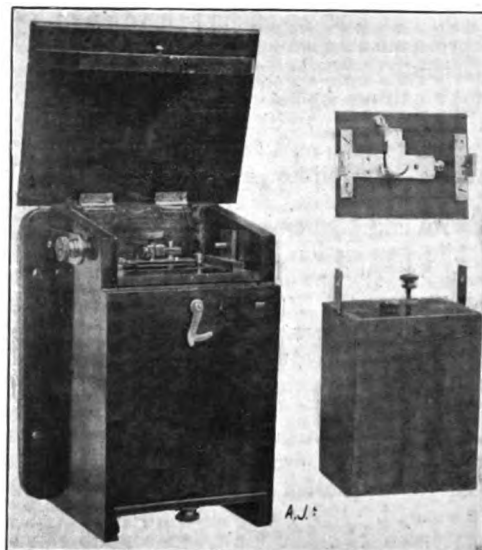
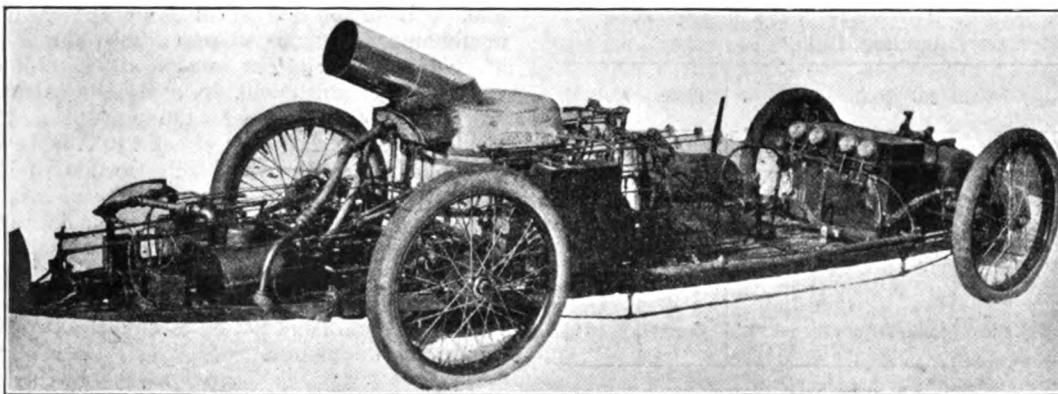


FIG. 21.—View of the Induction-coil complete in its casing, of the Trembler (with its base) detached, and of the Coil proper removed.

been carefully designed for its purpose, and the trembler is of a special high-speed type.

(To be continued).

RACES, RECORDS, AND TRIALS.



THE ROSS STEAM RACING CAR, WITH ITS "TORPEDO" CASING REMOVED.

THE ROSS STEAM RACER.—This "freak" machine, which recently attained such fast speeds at the Ormond-Daytona Beach Meeting is, as our readers will have gathered previously, somewhat similar in external appearance to the Baker Electric "Torpedo" of last year—for it is enveloped in a torpedo-shaped aluminium casing—but it is of larger size. The "Teakettle," as it is called, is shown without its casing in our illustration. It has two double-acting, twin-cylinder, horizontal engines of 3-in. bore, and 4-in. stroke, one of which is geared independently and directly to each of the rear wheels. These engines are mounted upon, and lie behind, the back axle, and they are controlled by one throttle-valve. The fire-tube boiler, which is fixed just behind the driver's seat—on the left side—is 24 ins. in diameter, 18 ins. high, and has 828 half-inch copper tubes. The working pressure is about 400 lbs. per sq. in., but could be increased to 600, while between the throttle-valve and the engines is introduced a super-heater, in the fire-box. The burner is fed with petrol under pressure, there is a variable-stroke feed-water pump on each engine, and each engine is fed with oil by its own lubricating pump, while, in addition, an injector is available for feeding water to the boiler. The wheel-base of this machine, which has a stayed angle-steel frame—carried on semi-elliptic springs—is 9 ft., the track is 4 ft. 8 ins., the weight is below 15 cwt., and the wire-spoked wheels—which are covered-in to reduce wind resistance—have 30-in. tyres. Lever steering is employed.

Ormond-Daytona Meeting.—It is well that at this meeting so many record speeds should have been attained as to render it a mark in the history of automobile speed racing. Besides the records, the meeting has been further rendered conspicuous by the picturesqueness of the site itself, and the charm of the

races taking place actually on the edge of the ocean. The whole meeting, however, appears to have been the subject of considerable mismanagement, a hint of which we gave several weeks ago, and it now seems likely that it may have far-reaching effects, even to the extent of putting the American Automobile Association out of

power as far as controlling race-meetings in the future is concerned. Serious complaints have been made of general gross mismanagement, many of the details being of a sufficiently sordid nature to render the recapitulation of them anything but a pleasant task. Mr. W. K. Vanderbilt, Jun., left in high dudgeon, before even his own trophy was competed for, and several other prominent racing notabilities and visitors were similarly indignant. In fact it is openly stated amongst the better-informed American automobile press, that the American Automobile Association is likely to be prevented from retaining national control of racing for the future as a result of this meeting. The *personnelle* of those put in control is not, it appears, such as to inspire confidence, and a radical re-organisation in this respect is demanded. The weakest point in the whole of the position is that at the moment there does not appear to be any other national organisation which can take hold of the racing side of automobilism with a firm and experienced hand, and guide it from the present position into which it appears to have drifted. "A policy of undivided devotion to the broad interests of the sport, ignoring all private and personal issues, and looking only to the general good of the industry," is, in the opinion of one of our Transatlantic contemporaries, what is required to form a capable and efficient board to control automobile racing in America.

World's Records.—We have summarised below the particulars of the recognised official world's records established at Ormond-Daytona Meeting, a detailed report, including these figures, of which, we gave in our issue for February 4th:—

World's Records Established at Ormond-Daytona, January, 1905.

Miles.	Driver and Machine.	Time.	M.P.H.
		m. s.	
1	A. McDonald (90-h.p. Napier) ...	0 34½	104·65
5	A. McDonald (90-h.p. Napier) ...	3 17	91·37
*1	Louis S. Ross (20-h.p. Ross Steamer)...	0 38	94·73
100	H. W. Fletcher (90-h.p. De Dietrich) ...	78 24	76·60
10	A. McDonald (90-h.p. Napier) ...	6 15	96·25
20	A. McDonald (90-h.p. Napier) ...	15 23	78·20
50	H. W. Fletcher (90-h.p. De Dietrich)...	38 58	76·90
*1kil.	Louis S. Ross (20-h.p. Ross Steamer)...	0 24½	92·44

* For steam cars.

Havannah (Cuba) Automobile Meeting.—Immediately following the Ormond-Daytona Beach Meeting another gathering of racing cars took place at Havannah, when, in addition to some trials for records over the kilometre and mile, a number of other events were run off, including a 100 miles race on the road. In the latter, the first place went to a Cuban driver of the name of Ernesto Carricaburu, who drove Mr. Edward Thomas' 90-h.p. Mercedes car over the course in 1 hr. 50 min. 53½ secs., being followed by Tracy on a 40-h.p. Renault in 1 hr. 52 min. 26 secs. On the third and last day of the meeting, Fletcher scored some local records on his car as follows: 1 kilom., 28½ secs.; 1 mile, 45 secs.; 5 miles, 3 min. 4½ secs.; 10 miles, 5 min. 57 secs.; 20 miles, 11 min. 18½ secs.

Vanderbilt Cup—Engagements for this Cup, it has been determined by the American Automobile Association, will not close this year until April 15th.

The Grand Prix de la Republique.—A new sensation was provided in Paris on Sunday by the announcement which appeared in *Les Sports* offering a first prize in cash of 150,000 francs in connection with a new long distance international race, which it has been determined to found, and which is to take place at Aix-les-Bains as part of the Aix Grand Automobile Week, which for some time has been announced to be held in that favourite health resort. The 150,000 francs is to be divided as follows:—125,000 francs to the proprietor of the winning vehicle, 20,000 francs to the driver, and 5,000 francs to the mechanic. The race is to be run under the rules of the A.C. de France—over a distance of about 500 to 550 kiloms. in one stage—the latter part of June being the date selected for this important event. It is to be an open international race, each manufacturer of the world being at liberty to enter a maximum of three cars, the entrance fee for which is to be 4,000 francs per vehicle or 10,000 francs for teams of three belonging to the same proprietor. This splendid prize money is provided by *Les Sports*, *Le Journal*, and the municipality of Aix-les-Bains jointly, and the main control of the whole of the event will be in the hands of *Les Sports*, whose destinies are governed by M. Georges Prade, the very gifted French automobile writer. This important race will be only one item in a series of events spread over about eight days, the programme providing for an automobile exhibition, a gymkhana, a battle of flowers, races for motor bicycles, motor boat contests on the Bourget Lake, the meeting probably resolving itself into one of the most important that has ever been held on the Continent.

The circuit is reported by experts to be a very fine one, a large portion of it being practically free of inhabitants, and giving an opportunity for an exhibition of high speeds. *Per contra* some stiff hills are encountered, which will, to a certain extent, counter-balance the straight runs for the high-speed cars. After leaving Aix, the road runs straight to Albens, from there to Alby, which is the worst hilly portion of the circuit, Annecy, Faverges, Albertville, to Montmelian. Between the two latter points is a clear flat run of about 37 kilometres, which should be one of the fastest stretches on the whole circuit. Probably four neutralisations will be required, viz., Aix-les-Bains, Chignin, Albertville, and Annecy. The circuit extends to about 135 to 140 kilometres.

Gordon-Bennett Cup and the Grand Prix A.C. de F.—We allude editorially this week to the victory which was won by the various clubs associated on the Gordon-Bennett Commission in securing that the Grand Prix of the A.C.F. and the Gordon-Bennett race should this year be run separately, the Grand Prix being run a fortnight subsequent to the Gordon-Bennett. This is not, however, the only conclusion at which the Commission arrived. On the contrary the resolutions passed were as follows:

1. That the Gordon-Bennett Cup shall be run for alone, according to the existing regulations.
2. That the Grand Prix shall be run a fortnight afterwards.
3. The clubs taking part in the Gordon-Bennett Cup are to pay the expenses of the race.
4. The rules for the Gordon-Bennett Cup are to be revised for the future, and the principle is to be adopted of proportional representation according to importance in the automobile world of each country competing. The figures given for the Grand Prix of the A.C. de France of 1905 will be approximately those which will be



ORMOND-DAYTONA BEACH MEETING.—A snap of A. Macdonald on the 90-h.p. Napier, making his world's record of 34½ secs.

adopted for the proposed regulation. These figures will be subject to revision every year.

It will thus be seen that the resolutions ultimately arrived at were of the nature of a compromise, and that, while obtaining the separation of the two races this year, the other automobile clubs have provisionally consented to the adoption in the case of the Gordon-Bennett Race for the future of a principle which will handicap several of them very seriously.

THE sum which is to be contributed to the expenses of the race by each of the clubs participating in the Gordon-Bennett Race for this year has been fixed at 25,000 francs, that is to say, £1,000 each.

THE French eliminating trials will probably be arranged to take place during the first week in June, and the Cup itself will be run from about the 15th to the 20th, the Grand Prix of the A.C.F. being competed for in the first week of July, and the regulations adopted on the 18th of January last will serve as an approximate base for the number of different cars to be allotted to the various countries in 1906.

THE resolutions at which the Gordon-Bennett Commission have arrived cannot fail to have the effect of putting those French manufacturers who said that they would not compete *unless* both events were run at the same time, in a rather embarrassing position. That they will adhere to their resolution can hardly be expected. If they depart from it they will make themselves look rather ridiculous. Some of our French contemporaries, at any rate, recognising the nature of the situation, are already attempting to make the path of retreat easy.

It is difficult to be sure how far the individual clubs will consider themselves bound by their representatives' action. For one thing, the contributing of £1,000 each may not meet with the approval of everybody, it having hitherto been the custom for the club of the country in which the Gordon-Bennett Race was held to defray the whole of the expenses. This, at any rate, was what occurred in this country and in Germany. That the French should now succeed in inducing the other clubs

to bear the greater portion of the expense may certainly be looked upon as a diplomatic triumph possessing a distinct commercial value.

THEN as regards the provision of proportional representation to be introduced in future into the Gordon-Bennett Race—it is against this particularly that we and every one else interested in the maintenance of the Gordon-Bennett Race as a genuine sporting event have most vigorously protested. If the French like to introduce this principle into the Grand Prix that is their affair, but everyone who really has the sporting interests of automobilism at heart will object to seeing the Gordon-Bennett Race deprived of its sporting character. For it will lose this character altogether if the proportional representation principle is maintained. An analogy will enable this to be seen at once. Supposing that in the case say of a horse race, like the Derby, the number of horses which might be entered by France or Ireland were restricted in proportion to the number of race horses which those two countries annually produce, the value of the race as an international sporting event would at once disappear. The absurdity might be made even more manifest in the case of a game like football. What would be said if someone solemnly proposed that the number of teams which any country might enter for the International Cup should be determined by the number of footballs which that country annually manufactures?

ON the whole the negotiations would seem to be a distinct triumph for France, at any rate as far as the recognition of the principle of proportional representation is concerned. From another point of view, however, the triumph is not so marked. There are the strongest grounds for believing that the determination of the French to maintain the principle is the most convincing proof that they recognise that their position as automobile manufacturers is being seriously threatened.

IN regard to the Liege Exhibition Automobile Week, a few particulars of which we gave in our issue of January 28th, the date has been postponed for this fixture until the end of July.

Cannes Automobile Week.—The end of last week saw the finish of a highly-successful opening of the Automobile season on the Continent, when the Cannes Automobile Week was concluded. After the Concours d'elegance, with which the festivities opened on the first day, the preliminary tests in the competition for the A.C. Cannes Cup were commenced. These tests consisted of, on the first day, brake trials and fuel consumption tests, and on the next day speed trials over the flying kilometre on the flat and hill-climbing tests. The first of these, viz., the brake test, took place on the top of the Vallauris Hill, when Chevalier Florio's 90-h.p. Mercedes proved the best by stopping in a distance of 11 metres, Mounier, on an 8-h.p. Renault, coming next in 12 metres, Rouff (16-h.p. Rochet Schneider) third in 15 metres, Gallice (12-h.p. Bayard-Clement) fourth in 18 metres, Quinson (10-h.p. Gladiator) fifth in 19 metres and Chevalier Florio's 60-h.p. Mercedes sixth in 21 metres. The Litre Fuel Consumption Trial was held in the afternoon of the same day, the course selected being round and round the Croisette Square, each circuit being 370 metres. In this the premier position for distance covered on the amount of fuel allowed fell to Quinson, on his 10-h.p. Gladiator, who covered 12'344 kil. before coming to rest; (2) Mounier (8-h.p. Renault) 11'67 kil.; (3) Chevalier Florio's De Dion Bouton, 8'92 kil. In this portion of the contest Chevalier Florio's big 90-h.p. Mercedes not unnaturally came out at the bottom, with 3'878 kil.

The next day the competition over the flying kilometre on the flat took place on the Boulevard Jeanhibert. The surface was not good, and therefore not conducive to high speeds. Chevalier Florio, with his 90-h.p. Mercedes, came in an easy first in 30½ secs., his 60-h.p. Mercedes being next in 43½ secs., the third in this test being Batigne, on a 15-h.p. Radia, in 59½ secs. After luncheon the competitors re-assembled on the Saint Jean Hill, which has a gradient as high as 19 per cent. and 20 per cent. In this, for every passenger carried up by each car 25 points were allowed, the results being that Chevalier Florio's 60-h.p. Mercedes topped the list with 175 points, Rouff's 16-h.p. Rochet Schneider came second with 150 points, Florio's 90-h.p. Mercedes securing the same number, and Gallice, on the 12-h.p. Bayard, being allotted 125 points.

The final results for the Cannes Cup, based upon the

tests detailed above, and several other factors specified in the rules in regard to price of car, &c., have been announced as follows:—Winner, Chevalier Florio's 90-h.p. Mercedes; 2. Gallice, 12-h.p. Bayard-Clement; 3. Rouff, 16-h.p. Rochet Schneider; 4. Florio's 60-h.p. Mercedes; 5. Florio's 16-h.p. Fiat; 6. Mounier, 8-h.p. Renault; 7. Loubet, 8-h.p. Peugeot; 8. Quinson, 10-h.p. Gladiator; 9. Marcy, 12 h.p. Cottereau.

The completion of the programme was devoted to a paper-chase, gymkhana, &c.

Tyre Fitting Competition at Olympia.—The series of tyre fitting competitions which took place daily during the Olympia Motor Show were a great success both from the operators' and from the public points of view. The competitors had to take out the inner tube of a Continental tyre, substitute a fresh one, and re-inflate, the winners being those who did the quickest time. Much interest was taken in the competition, for which there were 96 entries, £45 being awarded in 15 prizes by the Continental Tyre Company. Record time was made by the winner, and the second easily beat the 6 mins. 30 secs. record set up at the Berlin Automobile Show. The following were the awards of the judges, Messrs. Swindley and Straight, who also acted as timekeepers:—

	m. s.	£	s.	d.
1st. J. Young, Wolseley Company, Birmingham	5 48½	10	10	0
2nd. J. M. Turner, Walton-on-Thames	5 54	7	7	0
3rd. A. Merry, Daimler Company	6 41½	5	5	0
4th. E. Horsey, London	6 51½	4	4	0
5th. C. Pallat, London	7 1½	3	3	0
6th. H. Turner, London	7 4½	2	10	0
7th. J. Taylor, Hutton and Co., London	7 10	2	0	0
8th. A. Orson, Wolseley Company, Birmingham	7 13½	1	10	0
9th. A. Alsop, Rex Motor Company, Coventry	7 42½	1	5	0
10th. C. W. Payne, Hutton and Co., London	7 46½	1	1	0
11th. F. L. Ellingham, London	7 54½	1	1	0
12th. H. Jennings, London	8 11½	1	1	0
13th. G. Sawyer, Guildford	8 11½	1	1	0
14th. G. Pinchin, Hutton and Co., London	8 18½	1	1	0
15th. A. Bond, Wolseley Company, Crayford	8 35	1	1	0

This first competition having created so much interest, Mr. Brodtmann intends having another prize competition arranged at the Automobile Exhibition which commenced in Edinburgh on Friday of this week.

Versailles Reliability Trial of the A.C. Seine-et-Oise.—For the first time in France a real reliability trial, based mainly upon the principles embodied in the



Watching one of the racing cars over the Speed Mile course. Note the "Grand Stands" on the left.

Mr. and Mrs. E. R. Thomas, viewing Mr. A. Macdonald racing for the E. R. Thomas Trophy in the 20-Mile Race, which he secured.

ORMOND-DAYTONA BEACH MEETING.

well-known rules governing British reliability tests, commenced on Sunday last under the auspices of the Seine-et-Oise Automobile Club. Some time ago we gave full particulars of the main factors which it was determined should govern this contest, and these include the strict observance of each car, closed controls daily at Versailles, from which the cars start each morning, and in like manner the checking of all repairs on the road or at the midday halt for luncheon. Consumption of fuel is recorded, and speed tests on the hill, on the flat, and other points are taken note of for the purpose of enabling the judges to ultimately decide in connection with the awards. The vehicles are divided into classes according to price, special categories being allotted for motor bicycles. A good number of entries were received and a fair number of competitors are actually taking part in the daily journeys. These, commencing on Sunday last, started daily from and returned to Versailles each day, the following tours being reached each

journey: Orleans, Chateau Thierry, Evreux, Beauvais, Chartres, Louviers, and Fontainebleau, the latter being the outward destination for to-morrow, Sunday, the last day's run. On the first day of the Trial, February 19th, a special one-day run was permitted under official observation for privately owned tourist cars. Twenty-four entered under this category, and the first place was secured by Sanz, who secures the Gold Medal, with an 18-h.p. Peugeot car, his time being 4 hrs. 44 secs.; Cusson, on a 16-h.p. Automoto car, secured second place in 6 hrs. 23 mins.; and Truffault, on a 1-cylinder 8-h.p. De Dion car, was third in 6 hrs. 45 mins.; Amet, on a similar type of car, being fourth in exactly 7 hours. In regard to the competitors who have entered for the full seven days' runs, as yet it is too early to give any details of the respective performances, which are likely to prove of any material value. When the full journeys are completed, we hope to give at the earliest moment the official results.



MOTOR BOATING.



A 14-h.p. 3-cylinder Brooke Petrol Launch, at full speed.

British International Cup for Motor Boats.—No date at present has been fixed for the final closing of the entry list for challenging for this Cup, presented by Sir Alfred Harmsworth. At present, only England has challenged France, the holder of the trophy. The French Club announce that they will specify later the closing date for entries. The rules provide that in the event of no challenge being received for the Cup by February 1st of any year, no race is to take place for the Cup that year, but under this rule nothing is specified (provided a challenge from any single country has been received for the Cup by February 1st), as to the closing date for entries.



COLONEL RENARD is completing the machine which he has had in view for a long time past, which is of the aeroplane type, the framework of which is constructed of steel tubing and piano wire. The motor has been made as light as possible and has its two cylinders slightly inclined to one another in the form of a "V." It does not appear that any actual tests have been made with the machine, but the best results are hoped for it.

Calais to the Thames.—At whatever point it is finally determined the Calais to the Thames Motor Boat Race is to terminate, one thing is certain, that if Ramsgate is made the finishing point, the competitors and those associated with the organisation will receive a hearty welcome from that popular seaside resort. The Mayor, Mr. Robert Dowling, is fully alive to the prestige which the termination of such an event at Ramsgate would confer upon the town, and has written a very strong letter to the President of the A. C. de France, urging upon the French Club the many advantages in regard to the splendid harbour, the excellence of the hotels, and the importance of the Ramsgate Yacht Club in receiving them.

ALMOST simultaneously a successful experiment was made with an aeroplane type of machine by Dr. Barton at the Alexandra Palace, and Dr. Barton states that he hopes to make a trial in his large airship in the course of next month. The ship has been greatly lightened by the removal of superfluous gearing, and lighter propellers have been substituted for the large 12-ft. screws. The new propellers have been designed to revolve at 1,250 revs. per min.

STEEL AS APPLIED TO MOTOR CAR INDEX* CONSTRUCTION.*

By J. S. Critchley, M.I.Mech.E.

THE importance of the study of suitable materials for the construction of motor cars cannot be too thoroughly considered or looked into, as, in fact, the motor car of to-day exists only in its present form by reason of the advances that have been made during recent years in the art of metallurgy. How great these developments are is well known to all who have in the ordinary way of business to deal with metals. However, in spite of all that has been accomplished, much remains to be done and explained, and, in the opinion of the writer, it is evident that great developments are in progress, which will yield results of the utmost importance to the growing industry connected with the motor car.

Perhaps no industry in the world calls for closer or more direct intercourse between the metallurgist and the constructor, and it is only by the most perfect co-operation between them that the best results can be obtained. The metallurgist must fully understand all the requirements of the motorist, and must give the full benefit of his experience. There must be no standing still, or a feeling that our materials are as good as they can be.

The motor industry undoubtedly calls for very special researches on the part of the metallurgist. No piece of machinery yet devised by man is more complex. When one looks at the specification of a motor car, it will be found that almost every known art or craft is involved in its construction, and of all these none is more important than the foundation of which it is built—namely, steel.

When one considers that 90 or more horse-power can be put into a vehicle with a total weight of under one ton, and capable of attaining a speed of over 90 miles an hour, one at once understands that it can only be done by the use of materials which, for ordinary engineering practice, would never be even suggested.

Steel includes a material as soft and pliable as any wrought-iron, and as hard as flint, a material with the elasticity of a Damascus blade, or as brittle as glass, a material with 25 per cent. more ductility than the best iron, or of 100 tons tensile strength to the square inch, and with no perceptible elongation, a material that will weld nearly as well as the best wrought iron, or a material differing from chilled cast iron only in its malleability, a material varying from almost nothing upwards in any of all these properties.

The varying qualities of steel are primarily due to the percentages of carbon and iron contained in the material, as also of the state of existence of that carbon. Iron may contain anything from .06 to 4½ per cent. of carbon, and in addition it may be alloyed with nickel, chromium, vanadium, all of which when alloyed in suitable proportions impart to steel a hardening effect, combined with toughness, and it is by the judicious alloying of one of these metals and carbon whereby steels of great strength and toughness are produced.

Before going any further into the properties of steel, it may be interesting to briefly state the source and history of steel making.

Pig iron, its source and foundation, is impure iron which contains up to 4½ per cent. of carbon, with varying amounts of silicon, sulphur, phosphorus, manganese, and other substances. The carbon is present in either of two forms, in a state of combination, or in a free state, as graphite. Cast-iron is classified by its colour—that is, it is either grey or white; grey iron is generally high in silicon, as the property of silicon is to throw the carbon into the free or graphitic state, which gives the iron the grey appearance. The melting-point of cast-iron is 1,960 deg. Fahr., and the tensile strength 6 to 8 tons per square inch.

It is obvious that steel is simply a combination of iron and carbon which can be produced either by adding carbon to malleable iron or taking carbon away from cast-iron. Steel stands midway between cast-iron and malleable iron as regards the percentage of carbon. Malleable iron by the addition of carbon merges into steel, and what is termed mild steel contains from .1 to .5 per cent. carbon. As the carbon content increases, we get harder steels until about 2 per cent of carbon is reached, when the material merges into cast-iron.

In order to produce malleable iron from pig or cast-iron it is necessary to remove the impurities and to reduce the quantity of carbon. In order to effect this, the foreign elements are eliminated by the partial oxidation of the iron. The class of cast-iron used is white iron, as this material does not become so fluid as the grey cast-iron, but remains for some time in a semi-fluid state, whereby it may be more readily worked. This working of the metal is termed puddling, and is effected in a hearth, heated in such a manner that only the hot gases are allowed to flow upon the metal, otherwise the impurities of the fuel might combine with it. The art of the puddler consists in raking the semi-molten mass to and fro and regulating the temperature. As the process of decarburisation is

effected the iron comes out in lumps, the heat not being sufficient to melt the more pure metal. These lumps or balls are collected, and then hammered to remove the melted and intermingled slag.

Malleable cast-iron is produced in the opposite way to case-hardened iron or steel, the process being not to add carbon to iron or steel, but to decarburise cast-iron. To produce these castings the pieces are first cast of iron, made from red hematite ore, and to make them so that they become malleable they are packed in cast-iron crucibles containing red hematite. The boxes or crucibles are heated, and during the heating carbon is removed from the outside, thus producing a malleable iron exterior with a core of brittle cast-iron. The time occupied by this process takes from three to nine days, according to the size of the castings and the degree of decarburisation required. These castings can be bent cold, but are somewhat brittle under heat. At high temperatures the internal core or kernel of cast-iron will melt, so that articles made from the material cannot be welded, although they may be brazed. The tensile strength of malleable castings is about 15 tons per square inch, and this material may be partially converted into steel by case-hardening.

Bessemer Steel.—The great use of steel instead of malleable iron dates from the perfection of the Bessemer process by Sir Henry Bessemer in 1856, whereby steel was produced at one-tenth the cost of the crucible process. The Bessemer process consists essentially in blowing large quantities of air into a molten mass of cast-iron, whereby the carbon and some of the impurities are burnt out. In order to effect this, the cast-iron is run into a converter, a huge vessel fixed on trunnions. The vessel is egg-shaped, and is charged in a horizontal position. A blast of air at a pressure of 20 lbs. per square inch is then turned on, the air being conducted through the trunnions to holes in the lining of the converter. The converter is then turned into a vertical position, and at the intense heat generated, the oxygen of the blast attacks the carbon and silicon. The process only lasts about twenty minutes, and, as in a 10-ton converter, about 13 cwt. of carbon and silicon are burnt, it can be imagined that the effect produced by the heat generated is a sight well worth witnessing. When the last trace of carbon is burnt away the intense flame suddenly drops, denoting that the iron is decarburised. It is then necessary to add a certain percentage of carbon to the molten mass, which is added in the form of ferro-manganese. The reason that the iron is totally decarburised is due to the uncertainty of being unable to stop the process at the right moment, and more perfect metal is obtained by adding the carbon after total decarburisation. The manganese, by uniting with oxygen, &c., plays an important part in the production of the final steel. Steel made by this process is termed acid steel, when the lining of the converter is silicious. As phosphorus is not eliminated by this process, the ore employed for the making of the cast-iron must be free from this impurity.

Basic Bessemer Process.—The original Bessemer process only being suitable for ores free from phosphorus, and as the quantity of such ores is limited as compared with inferior ores, it became necessary to evolve some method whereby such impure ores could be utilised with the Bessemer process. The difficulty was overcome by adding lime to unite with the phosphorus. However, with the silicious lining to the converter, silica being chemically an acid, the effect would be to form a combination between the silica and lime. A lining had therefore to be found which would withstand the action of the added lime, which was eventually discovered in magnesian lime or dolomite.

This was the invention of Messrs. Thomas and Gilchrist. In this process the blowing is effected in the same manner as the acid process—that is, until all the carbon is burned out, but instead of at once casting the metal, the blast is kept on for some two or three minutes longer, as the phosphorus is not removed until this after blow. The basic Bessemer process has proved a wonderful source of revenue for Germany and other countries where the ores contain large quantities of phosphorus. It is curious that the amount of phosphorus in the pig should be considerable; if there is too little the heat in the converter is not maintained. The importance of removing the phosphorus may be gathered when .1 per cent. in steel means bad steel, whereas .01 per cent. only occurs in steel of very excellent quality.

(To be continued.)

The Motor Volunteer Corps.—P. G. Hawkes, Esq., has been enrolled as a member of the Corps. Owing to pressure of Parliamentary duties, Captain (Bt. Major) A. H. Lee, M.P., has reluctantly been compelled to sever his connection with the corps. His resignation was notified in the *London Gazette* dated the 17th February, 1905. Captain H. H. Paynter and Mr. H. N. Watson were employed under Major-General Sir Leslie Rundle, K.C.B., &c., Commanding the North-Eastern District, on a staff ride in the neighbourhood of Beverley and Driffield, between the 16th and 18th instant.

* Excerpt from a Paper read before the Automobile Club on Feb. 9th.

A VARIABLE MOTOR-CYCLE GEAR.*

IN addition to extending the range of the engine gear from 9 to 27 in place of 9 to 20, the change gave several incidental advantages to compensate for the additional chain:—The exposed sun bearing of the forward gear, which was always giving trouble, was now protected by an oil-retaining hub with ball bearings, so that it ran more freely, and required less attention. (2) Both sun pinions could be arrested in succession by back pressure on the pedals, giving complete pedal control of both gears, independent of the leather band-brake, which often failed. The leather band was retained for convenience of starting by pushing, in case either of the pedals were lost, which happened twice in 12,000 miles. It was also useful for re-starting the engine when free-wheeling down a hill. (3) Incidentally the forward gear was mounted, like the back gear, on a $\frac{3}{4}$ -in. axle with independent adjustment for the engine chain, which saved a great deal of trouble. See (c) above.

Although the engine was now no longer able to run free when the machine was stationary (a somewhat doubtful advantage for an air-cooled engine without a governor), most of the other advantages of the free engine were retained. (1) When driving the machine in thick traffic it was possible to crawl at two or three miles an hour

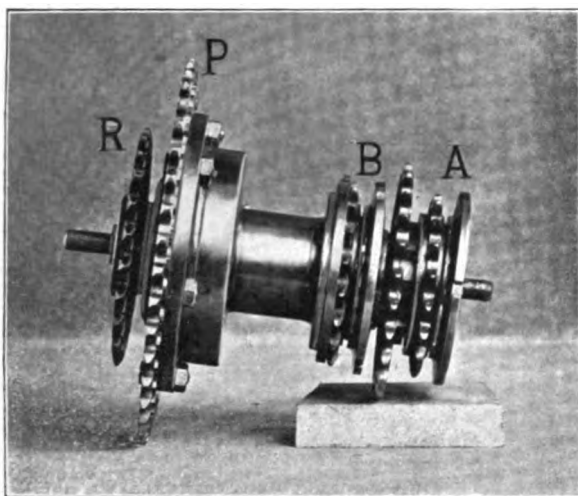


FIG. 3.—The Callendar Gear Complete.

on the lowest gear, and to change back smoothly to either of the top gears by the pedals, without touching any levers except the exhaust-lifter. (2) The machine could be pushed forwards, or could run downhill forwards, without driving the engine, but it could not run backwards, unless the exhaust-valve was lifted. The chief practical objection to the use of the free engine when the machine was stopped on a hill was the risk of running backwards, as none of the brakes fitted to the machine would act properly in the backward direction. Without the free engine the machine would always stand safely by itself. (3) By turning the pedals backwards, with the back wheel on the ground and stationary, the gear and the engine could be revolved without moving the machine, just as well as with a free engine gear. This was very useful for testing the spark, &c.

The complete gear in its final form is shown assembled in Fig. 3. The 24 T chain-wheel, R, on the left is screwed to the ring of the epicyclic gear, and connected by chain to the rear wheel. The large 40 T chain-wheel, P, is screwed to the disc carrying the planet pinions, and bolted to a gun-metal casting which carries at its other end one side of the sun-planet clutch, B. The two moderatums, A and B, and the other chain-wheel on the right, are mounted on the hub which carries the sun-pinion. The gear is shown partly dismembered in Fig. 4. The part on the right is the Garrard gear, fitted with a $\frac{3}{4}$ in. axle, and modified by the removal of the internal free-wheel-clutch, which was troublesome to get at—see (h) above. The hole, see (e), for ejecting oil was stopped up, and the free-wheel-flanges, being no longer required for retaining the rollers or limiting the side play of the planets were removed, and an oil-retaining ring soldered on the outside. The gun-metal casting being screwed directly to the sprocket, P, and fitting closely over the gear box, G, relieved the six screws holding the gear-box together from most of the racking strain, (g), already referred to. The chain-wheel, C, fixed to the flange at the small

end of the gun-metal casting, is not used as a chain-wheel, but provides a bearing for the casting, and carries on its side six inclined planes operating the moderatum rollers. The slip-ring of the moderatum clutch is shown at D, with the rollers in place leaning against the $\frac{3}{4}$ in. axle. The three notches in the edge of the slip-ring are for engaging the pawl—not shown—which effects the change of gear by holding the slip-ring. When the slip-ring, D, is *not* held by the pawl, it is carried forwards by the friction. disc, B, which is screwed to the hub carrying the sun pinion; the rollers then run up the inclined planes, and force the slip-ring against the friction disc, B, so that the sun cannot overrun the planets. Holding the slip-ring by the pawl frees the rollers, and permits the sun to overrun the planets. The sun pinion, S, slips over the $\frac{3}{4}$ in. axle, and enters the gear-box, G, engaging the planet-pinions. The moderatums, &c., on the sun-hub are all screwed on a standard right-hand thread, and locked by a single disc with a left-hand thread, so that they are easily removed or replaced. The whole gear weighs 9 lbs., but it might easily be made lighter, if desired, while retaining sufficient strength. The gear has been oiled about once in 500 miles through a single hole in the hub, but as it has given no trouble in this respect, it may not be necessary to oil it so often.

The advantage of this type of gear is that all changes are effected by friction, and that the steps are so small that the variation is practically continuous. The gears showed very little wear after driving a load of 5 cwt. a distance of 10,000 miles. The obvious objection to a gear of this type was the multiplication of chains, which were exposed to wear and required adjustment. Nothing

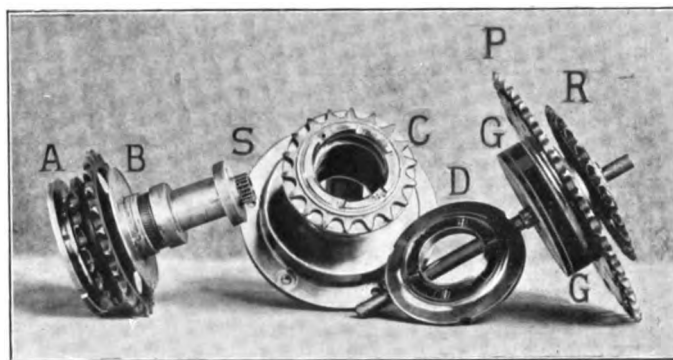
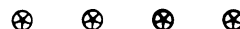


FIG. 4.—Component Parts of the Callendar Gear.

has yet been discovered that is equal to the ordinary bicycle chain for efficient transmission or for accessibility and ease of replacement and repair. A complete set of four motor chains costs less than 15s., and would wear on the average about 2,000 miles. A longer life for the motor chains might have been secured by using heavier and more expensive chains, such as $\frac{3}{4}$ in. pitch by $\frac{1}{2}$ in. wide, in place of the ordinary $\frac{1}{2}$ in. pitch by $\frac{3}{8}$ in. wide. But, apart from the additional expense and weight of the heavier chains, it was a great advantage to use the common bicycle pitch and size. A chain was generally removed and replaced by a new one when it had stretched about $\frac{1}{2}$ in., which was about the limit of convenient adjustment, and of satisfactory running on the large sprockets. Beyond this point the chain was too much out of pitch, and more liable to run off, especially if loose.

(To be continued.)



"Irish Neat."—Mr. R. J. Mccredy read a paper last week before the Automobile Club, entitled "Touring Incidents," the incidents being things that happened to the writer while touring about Ireland on an automobile. There was not much about automobilism in the paper, but there was a great deal about Ireland. In fact it was crammed full of Irish humour, with a good deal of Irish pathos, and threw many interesting side lights on the inborn courtesy and quiet dignity of the people. It is impossible to make an adequate selection from Mr. Mccredy's anthology—one would like to give the whole of it—but one or two gems must suffice. At one out-of-the-way hotel, or rather inn, the tourist asked to be provided with poached eggs. In that part of the country the term "poached" is not known as a method of cooking, but poached commodities of various kinds form a regular staple. In fact there are districts in which the people may be said to live on illicit whisky and illegally captured salmon. "There are no poached eggs, in the place, sir," replied the ingenuous

* Abstract of a paper, by Prof. Callendar, read before the members of the Auto Cycle Club, on Wednesday, February 8th, 1905 (continued)

waitress, "but I think I could get you some poached salmon." When Mr. Mecredy made his first tour in County Clare practically no automobilist had been seen there before. He was going along a road with acetylene lights burning brightly, when some of the local hard drinkers were driving homewards in a cart from their customary house of entertainment. Suddenly the automobile came round a corner, and all the men instantly jumped out of the cart. Some, who had hopes of their future, knelt on the road in prayer, but others, who probably realised that their case was hopeless, filled the air with profanity. The police then appeared on the scene, and were about to arrest the quartette for being intoxicated, when it was explained to them that "Antichrist had gone by in a fiery chariot, and that the end of the world was at hand." One example of the other side of Irish character may be

given. On one occasion Mr. Mecredy had the Rev. Mr. Whotton as a passenger. While he was loitering outside a pleasant rose-covered cottage one afternoon, the elderly dame who owned the tiny domicile asked him if he would like a cup of tea. A few minutes later he was enjoying the cup that cheers, accompanied by hot cakes generously buttered, while the old lady entertained him with her quaint sayings. Before departing he asked her what he owed. The reply of this typical specimen of Nature's gentlewomen was as conclusive as it was courteous and tactful. "You are my guest," she said: "I invited you." The paper is full of humour mingled with occasional pathos, and is accordingly a true presentation of the Irish character. Mr. Mecredy is to be congratulated on having so capably portrayed the chief characteristics of his country-people.



CLUBS AND ASSOCIATIONS.

Automobile and Cycle Engineers' Institute.—A new departure was made at the last meeting of the Institute, which took the form of a number of short papers, followed by discussions, and interspersed with a programme of music. The evening was so successful that the Council propose from time to time holding similar meetings. At this last gathering, the papers included "4-Cylinder Motor Bicycles," "Electroplating," and "Carburettors," dealt with respectively in a very able manner by Messrs. Binks, Bayley and Walford. With a view to continuing these evenings, the Secretary, Mr. Charles H. MacPherson, 39, Bennetts Hill, Birmingham, will be glad to receive communications from any of our readers who have any subject of technical interest which they would like to lay before the Institute, or which they would like to have brought up as a subject for discussion by the Institute.

Berkshire Automobile Club.—The first annual general meeting of this club was held at the Great Western Hotel, Reading, last week, when Major F. R. Portal presided. The report was a very satisfactory one and dealt with the foundation of the club and the various work which had been accomplished during the year and the meetings which had been organised for the members. It also pointed out that the club now consisted of 87 members, and that the financial statement showed a considerable balance of cash in hand in addition to a sum of £200 on deposit.

Lieut. Colonel Waring, after dealing with some of the points in the report, mentioned that the repairs to the roads in the county were likely to be considerably improved, as the new county surveyor, who was taking up his duties on April 1st, was a very keen motorist himself, and would no doubt, he thought, sympathise with the work of the automobile club in this respect. Three of the members of the committee retired in accordance with the rules, and not being eligible for re-election at the meeting, their places were filled by the election of the Rev. J. D. Ouvery, Mr. George Alston, and Dr. A. Gordon Paterson.

Ladies' Automobile Club.—A very successful afternoon was arranged by the club during the Olympia Exhibition on Thursday of last week, the "club day." About 200 members and their friends gathered together in response to the invitation of the Society of Motor Manufacturers and Traders, a large room off the gallery being set aside, where afternoon tea was served. Amongst those who participated in this interesting gathering were:—Mrs. Ash, Mrs. Bowen, Lord and Lady Borthwick, Mrs. T. B. Browne, Mrs. Harold Browne, Mrs. Briggs, the Hon. Mrs. Bailey, Mrs. Bingham, the Misses Cadman, Mrs. Arthur Cross, Mrs. St. John Coventry, Mrs. Walter Crawshaw, the Hon. Mrs. Corbet, Capt. and Mrs. Deasy, Mrs. Henry Edmunds, Miss Evans, Mrs. Frederick Foster, Mrs. Philip Foster, Miss Goldney, Lady Waldie Griffith, the Hon. Mrs. Gifford, Mrs. S. Gandell, Mrs. Green, the Misses Honeyman, Mrs. Hartung, Mrs. Hardy, Mrs. Lawrie Johnstone, Mrs. Geoffrey Marks, Mrs. Messell, Mrs. Mark Mayhew, Miss Miles, Mrs. Henry Morland, Mrs. Macdonald, Miss Orpen, Mrs. Bruce Porter, Miss Pilcher, Lady Edith Fox-Pitt, Mrs. Peters, the Lady Beatrice Rawson, Mrs. Roget, Miss Parker, Mrs. Herbert Lloyd, Mrs. Rhodes, Miss Antrobus, Mrs. Gerard Leigh, Mrs. Manville, Lady Geraldine St. Laurence, Mrs. de Sales La Terrière, Muriel Countess De La Warr, Lady Margaret Spicer, Mrs. Waller, Mrs. Walter, Mr. and Mrs. Preston, Miss Gwladys Wilson, Mrs. Micklethwait, Mrs. William Whitaker, Miss Hanbury-Williams, and Miss d'Esterre-Hughes (secretary).

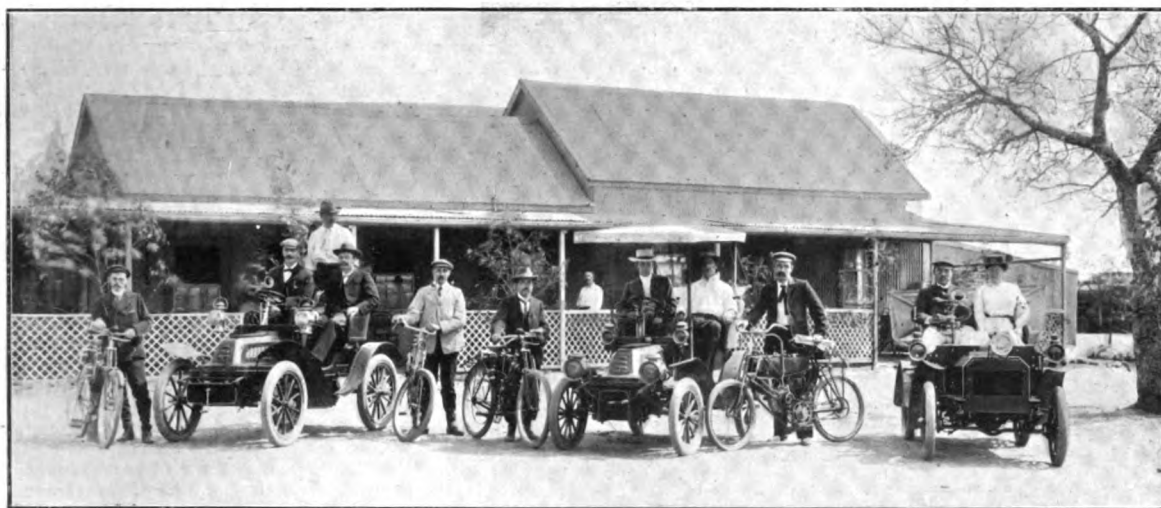
Peterborough and Counties A.C.—The arrangements for the amalgamation of the Northamptonshire Automobile Club and the Peterborough and District Motor Club, under the above title, have been completed, and the new club has now settled the details for its

future management. The Marquis of Exeter has been elected president, and among a long list of vice-presidents are Lord Lilford, the Hon. Leonard Brassey, Mr. G. C. W. Fitzwilliam, D.L., J.P., Major Wickham, Major Deacon, Mr. Richard Winfrey, the prospective Liberal candidate for South-West Norfolk; Dr. Walker, sen., Dr. Benson (Market Deeping), and Mr. George Keeble. A strong and influential committee has also been appointed. This includes the following well-known motorists:—Messrs. F. Heighton, B. C. Holmes, T. W. Percival, W. Walshaw, T. W. Southwell, J. Rowe, F. S. Southwell, J. Montgomery, F. Redhead, T. S. Rickman, W. Barrett, A. Morris, P. Mays, B. Gibson, R. S. Parriss, and A. Adams. The choice of captain has fallen on Mr. Richard Winfrey, and Mr. F. S. Southwell has been chosen for the office of vice-captain. Other officers appointed are:—Hon. solicitor, Major Deacon; secretary, Mr. E. H. M. Wood; hon. treasurer, Mr. B. Holmes. The Great Northern Hotel will be the headquarters of the new club. It has already a large membership, and the committee will spare no pains to make the coming season's programme as attractive as possible. In addition to a series of club meets and runs, it is proposed to hold a speed trial and hill-climbing competition early in the season.

The A.C. of Rhodesia.—The automobile movement is making steady progress in Rhodesia, where this Club, with headquarters at Buluwayo, is now in a flourishing condition. The membership is naturally still somewhat restricted owing to the excessively bad roads and the high cost of running a car under the prevailing conditions of the country. Considering all matters, it is highly creditable, therefore, that the Club members are able to muster between them five cars and eight motor cycles. The members of the Club include as usual enthusiastic advocates of mechanical traction, and we learn from the honorary secretary, Mr. A. E. Knowles, that one of the members has proved the advantages of the motor over the horse for that part of the world by running a car for hire from Buluwayo to World's View—the burial place of Mr. Rhodes—a distance of 27 miles out, doing the journey there and back in the day. Mr. Knowles points out that this may sound strange to ears in the Old Country that a matter of only 54 miles in the day should be made much of, but it must be taken in comparison with what can be done on the same road by horsed vehicles. Under no conditions up to the present has a four-horsed carriage been able to accomplish the journey in a single day.

Sheffield A.C.—At the annual general meeting of the club, which took place at the end of January, the report and statements for the past year were adopted, and the following officers elected for the ensuing year:—Vice-presidents: Messrs. H. Barber, E. F. Coupe, S. E. Fedden, Harvey Foster, D. Gilmour, and J. H. Pickford; Committee: Messrs. R. Brown, C. A. Clarke, J. E. Evans, T. H. Firth, A. F. Fletcher, E. H. Hill, P. R. Thompson, Dr. Thorne, Messrs. J. R. Wade, and W. Watts; Treasurer: Mr. E. F. Coupe; Hon. Secretary: F. B. Cawood; Hon. Photographer: Mr. J. Hudson Lygo.

For the season 1905 for the non-stop competition, Mr. E. F. Coupe has offered a gold medal for the longest distance by a member of the car section, and Mr. T. H. Firth has also offered a gold medal for the motor cycle section. The conditions governing this competition will be published shortly, as also the new competition entries, which are in course of being arranged. To-day, Saturday, the club have arranged a run to Worksop *via* Oldcotes, meeting at the Town Hall at 2.30 p.m., and for Saturday, March 18th, the outing will be to Bawtry *via* Blythe. The club propose organising a meeting of all owners of motor cars in the surrounding district at the Artillery Drill Hall on some Saturday afternoon, which, it is suggested, would give an excellent opportunity for members to inspect each others' cars and compare notes.



THE AUTOMOBILE CLUB OF RHODESIA.—A meet of members of the Rhodesian A.C. whose headquarters are at Bulawayo.

South Wales and Monmouthshire A.C.—The report and balance sheet to December 31st last covers only nine months since March 31st, 1904. This, however, shows the club to be in a thoroughly sound position, having a considerable surplus in hand as the result of the nine months' working. The report gives particulars of the valuable work which has been carried out by the club, and records the means by which the club was enabled to secure the very excellent headquarters and motor house it at present occupies, of which we were recently able to give an illustration. The club, in combination with the Motor Union, strenuously fought the Newport Borough Council's proposal to restrict the speed of motor vehicles to ten miles per hour, and although no decision has yet been given by the Local Govern-

ment Board, it is confidently hoped that no restrictions will be permitted by the Board. We are glad to notice that the club have made a very strong protest in regard to the electric tram standards which are such a hindrance to the circulation of the traffic, especially in this case on entering Cardiff by the Newport Road. The officers of the club are as follows:—President, Right Hon. Lord Windsor; Committee (Chairman), Godfrey L. Clark, J.P., Col. Homfray, Messrs. W. Graham, J. J. Neale, Griffiths Jones, Capt. Hughes Morgan, Messrs. J. J. Handcock, V. Brukewick, D. W. Graham, J.P., A. G. Moffatt, Dr. Pritchard, J. L. Proger; Rev. M. Whiteside, hon. treasurer; J. Thompson Willows, hon. secretary; H. J. Powell, assistant secretary.



Serious Fire.—Early on Wednesday morning a tremendous blaze broke out among the motor-car emporiums of Long Acre. The fire appears to have originated either in or adjacent to Messrs. Slatter's premises in Chapel Place. By six o'clock the great building, comprising Messrs. Slatter's, the Ariel, Swift, and Mercedes Motor Car Showrooms, was in full blaze, and though a huge number of fire engines were pumping water on it from various directions the building was completely gutted, nothing but the four walls remaining a few hours later, and even they were obviously rocking towards their fall. The destruction of motor car and carriage stock is enormous, and quite a number of neighbouring premises were also absolutely gutted. In fact, the fire spread to the back of the various carriage dealers in Upper St. Martin's Lane, including the Star Motor Car premises, and several of these buildings were still burning at the rear after eleven o'clock. Messrs. Parker transferred the greater part of their carriage stock into the portion of Upper St. Martin's Lane (which as it was under repair formed a convenient garage), but many of their vehicles were practically burnt to skeletons. The loss of the motor car firms involved is enormous, and we are told that several Mercedes including a new 70-h.p., with an Ariel and Swift show chassis, are amongst the losses. Separated by the width of Chapel Place, Messrs. Morgan fortunately escaped fairly well, though they took the precaution to clear the whole of their stock out of their showrooms. The windows of the Collyer Tyre Company on the Chapel Place side of their premises, and some of the goods immediately inside them, were injured, but the

Company inform us that there will not be the slightest interruption in their regular business.

THE City of London's application for a speed limit of 10 miles per hour within its borders has been refused by the Local Government Board—the evidence in the opinion of the Board, not warranting such a course.

THE Queen Mother Margherita of Italy has just returned to Rome, we learn from a French source, after completing an automobile tour on her Fiat car, amounting to not less than 2,500 kiloms. In the course of the tour Her Majesty ran into French territory, and as she preserves a very strict incognito, her car, to her considerable amusement, was subjected to a very strict examination by the Customs House authorities on the frontier.



MOTOR CYCLING.

A ONE-THIRD Litre Fuel Consumption Trial took place last week under the auspices of the Motor Club of Marseilles. The competition was for motor bicycles and resulted in a victory for Thomas (Magali-Deckert) in 1 h. 18 mins. 29½ secs. During the test Thomas covered 10 kilometres in 7 mins. 42 secs.

Motor Cycling Club.—Eight new members were elected at the committee meeting held on the 14th instant.

In addition to the fixtures already announced it was decided to promote a members' hill-climbing competition to take place on a Saturday afternoon. Another Saturday afternoon is to be devoted to a consumption trial on novel lines.

It has been decided that in the all day London to Edinburgh run, and the 100 miles passenger trial, the weight-limit for motor cycles should not exceed 5 cwt. on the starting line.



The arrival of the German Emperor at the Berlin Automobile Exhibition, which he honoured with his presence, on the opening day, for a period of over two hours. The Emperor is seen alighting from his carriage at the entrance to the Exhibition building.

WE cannot feel anything but satisfaction at the decision given by Mr. Justice Warrington, of the King's Bench Division, in regard to the lawsuit between Messrs. Tilling and Dick Kerr and Co. The defendants were converting a horse-drawn tram-line into an electric tram-line in South London for the London County Council. As usual in these circumstances they had made the road practically impassable, and the temporary line they employed to keep the tram service running, projected above the surface of the road about two inches. This resulted in damage to a large number of the 'buses owned by the plaintiffs; and though the defendants argued that they were protected by the Public Authorities Protection Act of 1893, the Judge was not of this opinion, but gave judgment with costs for the plaintiffs, and ordered the damages to be assessed by the Official Referee. Many automobilists who have been victims to negotiating tramway contractors' kopjes should experience a strong measure of satisfaction and fellow feeling with the 'bus company.



BOOKS FOR REVIEW.

PUBLICATIONS RECEIVED.

- Les Motocyclettes.* By L. Baudry de Saunier and M. Adrian Gatoux. Vic. Ch. Dunod, Paris. 6 francs.
Metal Working. Illustrated. Edited by Paul N. Hasluck. London: Cassell and Co., Limited. 9s.
The Hardy Country. By C. G. Harper. London: A. and C. Black. 6s.
Petrol Motors and Motor Cars. A handbook for engineers, designers, and draughtsmen. By J. Hyler White, A.M.I.M.E. London: Longmans, Green and Co.
The Fan. By Chas. H. Innes. Manchester: the Technical Publishing Company. Price 4s.
The Construction of Cranes and other Lifting Machines. By E. R. C. Marks. Manchester: the Technical Publishing Company. Price 3s. 6d.
Motors and Motoring. By Prof. H. C. Spooner. London: T. C. and E. C. Jack. Price 1s.

CORRESPONDENCE.

* * The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

MOTOR CAR INSURANCE.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Is it not time that motor car owners took steps to protect themselves against the exorbitant rates of premium charged for insurance against accidents, fire, and third-party risks?

The rates were fixed at a time when motor cars were so few that there were no statistics of accidents upon which actuaries could base their rates, so that the figures were evidently guessed at, and inflated to ensure an ample margin in favour of the insurance companies.

The risks covered are often delusive, as was pointed out some little while ago in the pages of the Club Journal, policies being so cunningly worded as to afford nothing like the real insurance against pecuniary loss which they are ostensibly designed to do.

In a word, we pay excessive rates for insufficient protection.

I suggest that the time has arrived when motorists should club together and form their own insurance societies on the mutual principle. Such societies are successfully run by yacht owners, sometimes on such a small scale that a mere score or so of boats are insured. The work of management is done by honorary committees, and consequently no member pays a farthing more than his just share of whatever losses are incurred during a season. In connection with motor cars, the same might be done in isolated cases, where, for example, a local automobile club affords a ready-made organisation; but the disadvantage of a small society is that the members individually would have to pay heavily for an exceptionally bad accident or series of accidents. The larger the membership, the less sum of money each member would be called upon to contribute towards a heavy claim. On the other hand, a large membership entails paid officials; but, even so, the cost of management of such a mutual society would be less than the cost of management of a public company whose object is to make as much profit as possible.

Yours faithfully,

A. J. WILSON.

154, Clerkenwell Road, E.C.

Since the foregoing was written I see that an association of the kind has already been started in London.

A TRIBUTE DUE.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Now that the Exhibition at Olympia is over and its enormous success fully demonstrated to, I should imagine, every exhibitor, I think some united thanks from the whole trade to the President of the Society of Motor Manufacturers and his Show Committee should be given. They must have done an enormous amount of honorary labour to bring this show to its successful conclusion. It is only those who have served on such committees who truly realise the vast amount of time and labour that is necessary to keep the whole affair running along reasonably smoothly, but I think in this case that the whole Show has been such an unqualified success that some such appreciation from the trade ought to be shown.

It is a huge commercial undertaking, and it is to be hoped that from the Society's point of view the results are as gratifying as they have been from the exhibitors' and spectators' point of view.

Yours truly,

S. F. EDGE.

THE following sole agencies for 1905 Clément Cars have been arranged by Mr. E. H. Lancaster:—Messrs. J. Newton and Co., the famous motor experts of Manchester, for the Manchester district; Messrs. G. Cox and Co., Southsea, for the Hampshire district; and Messrs. Ayliffe and Son, for the districts comprising Cardiff and Monmouthshire.

COMMERCIAL POINTS.

Solid Tyres on Motor Cars.—The Sirdar Rubber Company send us the following letter, which was addressed to the Wolseley Tool and Motor Company by one of their agents, and relates to the results obtained with Sirdar tyres on some of these cars.

No. 1.—This car has done 12,000 odd miles on one set of tyres (Sirdars). The repairs to this car consisted of one new set of sleeves and ball races to all wheels, and two new pairs of driving chains; the steering gear brasses have now been renewed. This car has been driven in all weathers and as fast as possible; it has a 10-tooth sprocket. I shall within the next few months know the exact cost of the running of this car.

No. 2.—My own car has done about 7,000 miles, and is good for 4,000 more on the same tyres (Sirdars). The repairs consisted of new sleeves and ball races, and one new pair of chains.

No. 3.—Has done about 6,000 miles; repairs in proportion to above (Sirdar tyres).

No. 4.—Car only run 800 miles; repairs nil (Sirdar).

The owners of the above cars are more than satisfied. The owner of No. 1 car is opinion that no other make would have stood the knocking about.

My general opinion is that these solid-tyred cars ought to be on plain bearings.—J. N. A. RAY.

SOME time ago we recorded Mr. Little's enterprising offer, of the use of a 15 cwt. Albion delivery van, to the tradesmen of Newcastle-on-Tyne. We now learn this offer was so enthusiastically accepted on all sides, that Mr. Little had to curtail the duration of the trials to meet the great demand. The results have been most satisfactory and have done much to demonstrate the advantages of the motor car over the horse-drawn van. On each day the motor van did from 40 to 96 miles, and successfully accomplished an amount of work which had, in most cases, previously required as many as three horses and carts.

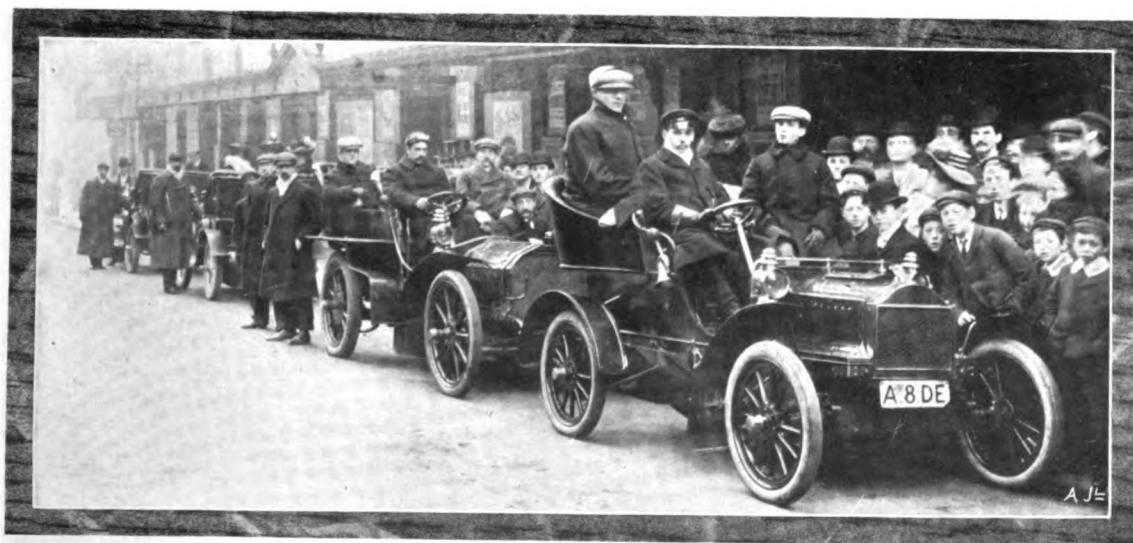
ANOTHER 10-h.p. White car has found its way to South Africa, and we learn, through a letter from its owner, that it has given a magnificent account of itself on the exceptionally rough, so-called, roads of the Colony. The car was recently taken a tour of 350 miles, including the Sir Lowry Pass and the Hottentot-Holland

mountains. In one place a road having a hill of one in four was encountered, and the passengers suggested getting out, but the car we learn took the hill with all the passengers up without difficulty. As has been proved on many occasions in America, the White is an almost ideal car for rough cross-country work.

THE COVENTRY CHAIN COMPANY, LIMITED, of Coventry, have received from the Siddeley Autocar Company, the following communication bearing upon the wearing qualities of their well known chain. The actual chains which were used were on view at the stand of the Siddeley Company at the Olympia throughout the Exhibition:—"In reply to your letter of this morning, we have much pleasure in stating that your chains which we used on our trial car not only gave the greatest satisfaction, but after having run 5,000 miles showed very little sign of wear."

We have just received from Mr. Lancaster, of 3, Leicester Street, W.C., the Clement Catalogue for 1905. This is a particularly well-illustrated description of the recent vehicles of this build, and contains, in addition to photographs of chassis and finished cars, line drawings of the metal-to-metal clutch and the differential and back axle. A useful little work has also been brought out by Mr. Lancaster on "How to Drive a Clement Car," and contains a large assortment of really useful, and what is of more importance, practical information.

MR. HARVEY FROST, of Harvey Frost and Co., Limited, has just returned from a most successful tour in the States in the interest of H. F. vulcanizers. Incidentally, Mr. Frost visited the Auto Exhibition in New York, where he found exhibitors doing good business, quite a brisk demand being made for cars of all types, and at all prices. Mr. Frost informs us that the American is prejudiced against cars made out of his own country, although two Napier cars which were shown created a great deal of admiration from the visiting public. The Americans, however, acknowledged that in car building they are quite twelve months behind France and England, and hope to get even with us, of course, in due time. Mr. Frost has had a most successful trip so far as the H. F. vulcanizers are concerned, very satisfactory arrangements being now completed for the manufacture and sale of these appliances in the States.



MACHNOW, THE RUSSIAN GIANT, AND HIS WIFE ON A 9-H.P. OLDSMOBILE.

Machnow, the Russian giant, is kept pretty close at the Hippodrome, and can very seldom get out to enjoy the fresh air when off duty, if only because he attracts an enormous amount of attention in doing so. Messrs. Jarrott and Letts good-naturedly determined to give him a day out, and show him something of the country, so on Sunday last they put a 9-h.p. Oldsmobile at his disposal, packed him into the tonneau and drove him to Crawley. The 9-h.p. Oldsmobile, with the giant in the tonneau, was photographed, with the other cars which accompanied the expedition, in front of the Hippodrome, and it is this view of the cavalcade that we reproduce on this page. The giant, who has his wife beside him in the tonneau, towers well above all the other occupants of the cars, and it is creditable to the little vehicle that it successfully transported him to Crawley without a mishap of any kind, for he weighs 33 stone. News of the expedition had evidently reached Crawley, for the whole village turned out to welcome the giant, and were highly delighted when he emerged from the car and strode into the George Hotel for lunch. Being so much indoors, the giant, in spite of his huge frame, is liable to take cold, so he was carefully wrapped up in some half dozen blankets, and the continued movement in the fresh air had the effect on him which it usually has on ordinary mortals—it made him very sleepy, and when he returned to London, we are informed, he went very quickly to bed.

British Exports and Imports of Motor Cars, &c., for 1905.

1905.	Exports, British and Irish make.					Foreign and Colonial Re-exportation.						
	No. of Cars and Value.		Parts Value.	No. of Motor Cycles and Value.		Parts Value.	No. of Cars and Value.		Parts Value.	No. of Cycles and Value.		Parts Value.
January ..	77	£ 25,590	£ 7,480	58	£ 2,026	£ 673	50	£ 19,006	£ 2,733	8	£ 214	£ 138

NOTE.—For 1904 comparative figures see full table for the year in our issue for January 21st, page 91.

Imports.

1905.	No. of Cars and Value.	Parts Value.	No. of Motor Cycles and Value.	Parts Value.	
January ...	362	£ 149,578	57	£ 1,842	£ 905

DOINGS OF PUBLIC COMPANIES.
BANKRUPTCY COURT.

H. B. Nelson.—At the London Bankruptcy Court, last week, the first meeting of creditors was held under the failure of H. Bywater Nelson, late of Harrington Road, South Kensington, motor car agent and dealer, trading as H. B. Nelson and Co. The debtor stated that on coming of age he succeeded to £10,000 under the will of Edward Hudson, of Leeds, his great-grandfather, and Edward Hudson, of Sheffield, is great-uncle, and invested £5,000 in shares of Friswells (Limited), of which he became a director, receiving a fee of £50 a year. He afterwards gave the shares back, receiving £3,184. With a capital of £1,200 he started as a motor car agent and dealer at 7, Harrington Road, but carried on business throughout at a loss owing to the heavy expenses in starting the business, and to the bad condition of the premises

and buildings adjoining. In September last the landlord levied a distress on the premises, where there were no motor cars, and he had not been on them since. His gross liabilities were £3,002 (£1,018 unsecured) and assets £498. He attributed his present position to loss in connection with the motor car business through insufficiency of capital, depression and competition in trade, and the unfinished condition of the premises. The case was left in the hands of the Official Receiver.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or parts of their objects.]

Bradley Motor Patents (Limited).—Capital, £20,000 in £1 shares. Object, to adopt an agreement with G. Pauling and M. D. Rucker, and to carry on the business of manufacturers of and dealers in steam, electrical, or other motor cars, &c.

Clarges Street Garage (Limited), 26A, Clarges Street, Piccadilly, W. Capital, £15,000 in £1 shares. Object, to acquire the business carried on at 26A and 26½, Clarges Street, and at 70 and 70A, Curzon Street, as the Clarges Street Garage. First directors, C. S. Wakefield, R. A. Fawcett, and W. Doman.

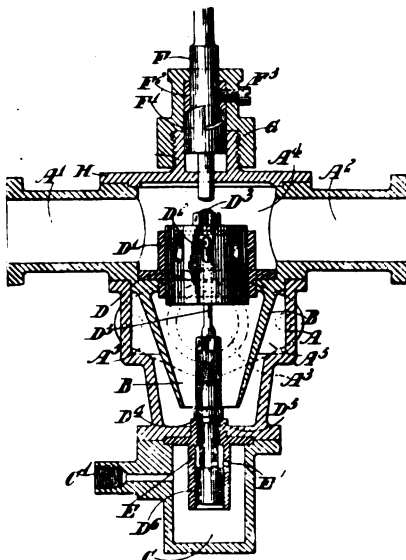
Cupelle Motors (Limited).—Capital, £3,000 in £1 shares. First directors, G. A. Powell, O. N. E. Copeland, and A. C. Gibbons.

Industria Motors (Limited).—Capital, £100 in £1 shares. Object, to carry on any business connected with the sale of motor cars, &c.

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E.
Thanet House, 232, Strand, W.C.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

5820. 9th March, 1904. Improvements in or relating to Carburettors suitable for Internal Combustion Engines. William Poland, King's Bench Walk, Southwark, London, S.E. This invention relates to the supply of oil or spirit in internal com-

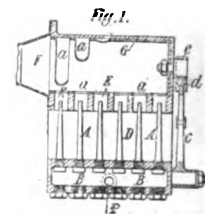


bustion engines, and also to the control of the supply of air. There is one figure, which is a sectional elevation in the central plane. The carburettor body, A, has the main air inlet, A¹, in line with A², the

outlet of mixture to the engine. A² is the second air inlet. The chamber, A¹, has the hollow piston rod, D, fitting and reciprocating in a cylinder or casing, D¹, between the chamber, A¹, and the chamber, A². The chamber, A², is provided with the cone, B. The piston, D, has the ports or openings, D², and a spindle, D³, which carries the valve, D⁴, fitting a seat, D⁵, at the end of a small cylinder, E, in which operates the piston, D⁶, connected with the spindle, D³. The chamber, C, is filled with the liquid fuel, which by means of the openings, E¹, finds its way into the interior of the cylinder, E, above the piston, D⁶. The chamber, C, is fed by the passage, C¹. Passing through the cap, G, on the cover, H, is a spindle, F¹, provided with a cam or spiral, F², engaging with the abutment, F³, held by the screw, F⁴. By turning the spindle, F, the amount of lift of the piston-valve, D, and therefore of the fuel-valve, D⁴, and the pump piston, D⁶, will be regulated. The suction of the engine-piston lifts the piston-valve, D², and with it the piston, D⁶, the space in the cylinder, E, being already filled with fuel, the ports, E¹, are closed by the piston, D⁶, the space in the cylinder, E, being already filled with fuel, the ports, E¹, are closed by the piston, D⁶, and the liquid fuel in the cylinder is delivered by the valve-seating, D⁵, to the air entering the passage, A², and the two together pass through the ports, D², where they meet the additional air entering by the passage, A¹, and the mixture passes to the engine by A². The lift of the valve, D⁴, can be regulated by the screw-cam, F.

5008. 25th February, 1904. Improvements in or relating to Carburettors for Hydro-carbon Motors. Adolphe Clement, 33, Quai Michelet, Levallois-Perret, Seine, France. Date under International Convention, 2nd March, 1903. The object of this invention is to provide a carburettor wherein the air and the hydro-carbon vapour are mixed in proper proportions and admitted to the motor in varying volumes according to the speed at which it is desired to run the engine. There are seven figures. Fig. 1 is a section in a vertical central plane. The carburettor comprises a series of injector nozzles, A, mounted upon a common feed-passage, B, which is

in communication by the passage, P, with a constant level floating reservoir. Six injector nozzles are provided, and each of the injector nozzles is adapted to permit the passage of the hydro-carbon or petrol spirit which mixes with air passing through the body of the carburettor, D, at a suitable velocity. The air passing the channels, E, at a velocity of 50 to 70 metres per minute, mixes with the spirit and is conveyed to the upper outlet, F, communicating with the engine. The injector nozzles, A, are arranged as shown in line and in the same plane. Above the passages, E, through which the mixture passes from D to F, is fitted the drum or cylinder, G in a similar cylindrical casing forming part of the body of



the vaporiser. The cylindrical shutter, G, has peripheral apertures or slots, a, which are made to register at the correct times with the ports or passages, E. The slots, a, are made of decreasing length. The first slot, a, extends almost the whole circumference of the drum, G, the next slot, a, to a less extent, by one-sixth of the circumference, and the other slots in decreasing proportion. Thus it is only after the drum, G, has moved through one-sixth of a revolution that the second injector is uncovered, and so on, thus progressively increasing the area of the slots and the feed. The rocking lever, c, carrying a toothed sector, d, meshing with the pinion, e, which turns on a pin forming the axis of the shutter cylinder, G, serves to rotate the cylinder, G, as desired. Feb. 15th, 1905.

The Automotor Journal, March 4th, 1905.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

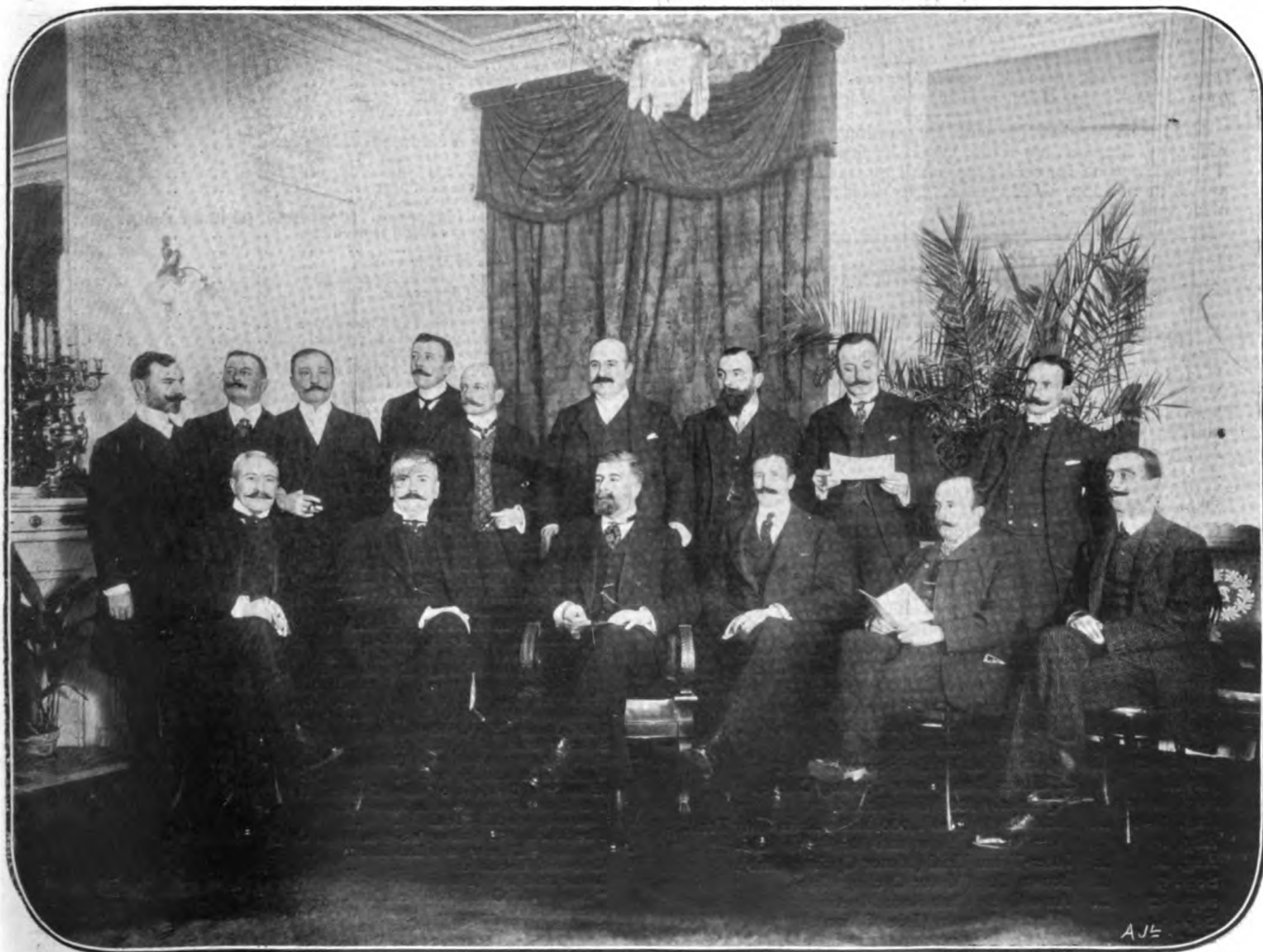
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Dr. Levin-Stoelting (Germany).	Graf Sierstorpff (Germany).	Bar. de Zuylen (France).	J. W. Orde (England).	Bar. de Crawhez (Belgium).	Mario-Monta (Italy).			

THE GORDON-BENNETT CUP INTERNATIONAL COMMISSION, which met last week in Paris to determine the conditions under which this Race should be held in 1905.

THE AUTOMOTOR JOURNAL.

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NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C., by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
Mar. 3-11 ...	Liverpool Motor Cycle Show.
Mar. 8 ...	*A.C.G.B.I. General Meeting.
Mar. 18-25 ...	Cordingley & Co.'s Exhibition (Agricultural Hall).
Mar. 21 ...	Motor Van and Wagon Users' Association Dinner.
Mar. 25 ...	Motor Cycling Club Brighton Run.
Apl. 3-10 ...	Auto Cycle Club Light-weight Trial (1,000 Miles).
Apl. 29 or May 1	May Day Parade
May 6 ...	Auto Cycle Club Hill Climb.
May 10-13 ...	Scottish A.C. Reliability Trials.
May 12 or 19 ...	*Quarterly 100 Miles Trials.
May 13 ...	Auto Cycle Club Members' Penalty Run.
May 20 ...	200 Miles Trial (Motor Cycling Club).
May 30 ...	*Gordon-Bennett British Eliminating Trials.
May 31 ...	Auto Cycle Trials and "Selection" Race.
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.).
June 10 ...	London-Edinburgh (Motor Cycling Club).
June 24 ...	100 Miles Passenger Trial (Motor Cycling Club).
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 8 ...	Auto Cycle Club Consumption Trial.
July 13 ...	*Hill-Climb (Henry Edmunds Trophy).
July 19-22 ...	*Brighton Speed Races.
July 24-28 ...	*Motor Boat Trials (Southampton).
July ...	24 Hours Run (Motor Cycling Club).
Aug. 11 or 18	*Quarterly 100 Miles Trials.
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 19 ...	*Van Trials, Light and Heavy Vehicles.
Aug. 26 ...	Inter-Team Trial (Motor Cycling Club).
Sept. 9 ...	Brown Cup (Motor Cycling Club).
Sept. 12 ...	Auto Cycle Club Race Meeting.
Sept. 14 ...	*Tourist Trophy (Isle of Man).
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).
Sept. 18-Oct. 3	*Reliability Trials.
Oct. 4 ...	*Speed Trials.
Nov. ...	Society of Motor Manufacturers and Traders Exhibition at Olympia.
Nov. 10 or 17	*Quarterly 100 Miles Trials.

* Automobile Club of Great Britain and Ireland Events and Papers.

Foreign Events (Trials, Races, &c.).

1905.	
Mar. 13-18 ...	Boston Exhibition.
Mar. 15-Apl. 9	Copenhagen Exhibition.
Mar. 16-29 ...	Vienna Exhibition.
Mar. 27-Apl. 5	Washington Exhibition.
Apl. 2-16 ...	Monaco Motor Boat Fortnight.
Apl. 14-23 ...	Nice Automobile Week.
Apl. 17 ...	Speed Mile and Kilometre (Nice).
Apl. 18 ...	Coupe de Caters (Nice).
Apl. 20 ...	Coupe Burton (Cannes).
Apl. 20-21 ...	Cannes Motor Boat Meeting.
Apl. 23 ...	Coupe Provinciale (Nice).
May ...	Paris Industrial Vehicles Trials (A.C. France).
May 4-12 ...	Auto Cycle Club de France Tour.
May 11-25 ...	Stockholm Automobile Exhibition.
June 18 ...	International Motor Cycle Cup.
June 26 ...	Mont Cenis Hill Climb.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Calais-London (Motor Boats).
July 30 ...	Circuit des Ardennes.
Aug. 6-9 ...	Paris-Trouville (Motor Boats).
Aug. 10 ...	Gaston Menier Cup (Motor Boats).
Aug. 11 ...	Anthony Drexel Cup (Motor Boats).
Aug. 12 ...	International Cup for Motor Boats.
Aug. ...	Herkomer and Bleichroder Races.

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PASSING EVENTS.

A Pyrrhic Victory.

DEALING last week with the subject of the Gordon-Bennett decision, and the fact that though the race would this year be run separately on the old lines, this concession was only obtained by giving in to the principle of proportional representation in future years, we pointed out that this was much more a victory for France than for Great Britain and the other competing clubs. A little consideration will show that this is painfully true. Supposing that Great Britain were to win the Gordon-Bennett Race this year, the following year the race would be run in the British Islands; but there would be about eight French cars allowed to compete against only three English cars. And we do not see that anything has been made clear on the matter of expense. This year, apparently, the British club will be compelled to contribute £1,000 to the expenses of running the race in France. But it has not been made clear that France will contribute anything for next year's race, excepting the numerical superiority of eight cars to three in the event of Great Britain or Germany, for example, winning. By agreeing to the Gordon-Bennett Race being run separately from the Grand Prix, for the time being, the French club may appear to have given way, and the other clubs to have won a victory, but it would appear as if their victory is of the distinctly Pyrrhic kind; in other words, more disastrous than a good many defeats. For next year, and afterwards, France will obtain every single point for which she has fought. It is, however, questionable whether the proceedings at the meeting of the Gordon-Bennett Commission were so technically correct as to compel the adherence of the respective clubs to the decisions of their representatives. One gleam of satisfaction comes out of the whole business. The French have obviously substituted the spirit of the Jew money-lender for that of the sportsman, which they previously adopted. If this shows anything, it shows that they are conscious that their supremacy in the industry is being threatened, and that is a circumstance which no British manufacturer can be expected to bewail. Recognising the importance to the development of a national automobile industry of properly controlled trials and races, Mr. Claude Johnson, one of the leading spirits of the British Empire and Motor Trades Alliance, to the programme of which body we recently referred, has sent us a communication taking generally very much the same view of the situation that we have put forward, both above and on a previous occasion, and using almost the same phraseology that we employed when dealing with the matter last week. It is evident that he sees practically eye to eye with ourselves on the subject, and he observes, as we pointed out, that the result of the International Conference—

"must be looked upon as a huge triumph for France, inasmuch as other clubs agree that in the great automobile event of the year—the Gordon-Bennett Race—France in future, so long as she maintains her supremacy in the motor industry, is to be represented by more cars than any other nation."

The British Empire Motor Trades' Alliance.

Quite another point, however, is raised when Mr. Johnson goes on to observe that—

"The administration of the Automobile Club of Great Britain and Ireland is to some extent in the hands of gentlemen who have large interests in the sale of foreign cars in England, and, therefore,

cannot be looked upon as a body which will see after the purely British manufacturers' interests."

And further adds—

"The Society of Motor Manufacturers and Traders is also administered to some extent by gentlemen who are financially interested in the sale of foreign cars in England, and, therefore, cannot be expected to favour any measure which would give preference to British cars as compared to foreign cars."

Although we do not feel sure that the imputation is deserved, yet a certain amount of dissatisfaction has from time to time been expressed in regard to the manner in which British interests have been looked after in sporting events. It is, however, obvious that if the British Empire Motor Trades' Alliance do not wish to find themselves open to the same criticism, they will have to be extremely careful as regards their membership. They will have to take particular pains that not one of them is in any way interested in the importation or sale of any foreign vehicles, or, indeed, has any interest in any foreign automobile manufacturing concern, directly or indirectly. Only then will they be able to command the full confidence of their members, and only then will the Alliance be the "militantly British" organisation that it seeks to be.

• • •

The Chickens Coming Home to Roost.

ONCE upon a time there were attempts made in this country to introduce the journalistic—we will not say race, but reliability trial, that is to say, the reliability trial organised, not by the Automobile Club who understand how to do it, but by journalists who know next to nothing about it, and who merely use the occasion as a means of advertisement. We prophesied—some of our contemporaries perhaps thought rather gloomily—about the horrible result that would follow if this practice became general. It has for a long time been the practice in France, and certainly one cannot say that the journals which have indulged in it there, have not understood the business and "worked" it for all it was worth. Nevertheless, horrible results have followed. The trouble, it will be observed, is this. If one journal organises a race or competition of any kind, and offers prizes, rival journals will all feel compelled to go one better. Then the original journal will go two better, and so the competition will go on until the majority are ruined and one or two only survive the awful ordeal. Even where this is not the case, jealousy of the scheme promoted by a rival is likely to create a desire to bring about a general crisis, presumably in the hope that, before too late, these sort of competitions will be vetoed, perhaps by the club or by the Government, and so the air may be generally cleared. This, at any rate, appears to be what is happening in France in regard to the mutual rivalry of *L'Auto* and *Les Sports*, concerning the new Grand Prix, which the latter, as we announced last week, is organising. Nor are the competing journals on the other side of the Channel the only people who are finding this out. As long ago as October 24th, 1903, we wrote as follows:—

"If every journal which thinks that the organisation of some sort of trial would be an excellent method of advertising itself were to organise a competition of the kind, the lot of manufacturers who might feel compelled to take part in some or most of them would be indeed an unhappy one."

Again on July 23rd last year we wrote:—

"The French newspaper trials, with a few leading exceptions, are becoming a by-word, and if they were all abolished by the Legislature to-morrow, we fancy the leading French manufacturers would breathe one united and long-drawn sigh of relief."

The French manufacturers, as we thought they would, are beginning to recognise the truth of this, and to find out that the multiplication of competitions, and the possible multiplication of important races, at which, for the sake of their reputations, most of them will be bound to compete, is placing an intolerable yoke upon their shoulders. The general opinion is gaining ground that "the multiplication of races and tourist competitions renders them dangerous, and ruinous at the same time to the manufacturers." "Save us from our friends" will probably be the cry which will go up generally in France, and longing eyes will be directed to the "islands of the blessed" on the northern side of the Channel, where these sort of things are regulated by one supreme authority, and where, thanks to the stand which has been made on the subject, enterprising journals have not been permitted to harry the automobile industry by starting competitions when, where, how, and of what kind, they pleased. It is not surprising, therefore, to hear that an organised movement is on foot in favour of a single great event under the control of the A.C. de France.

♦ ♦ ♦ Hitting Below the Belt.

THERE is an ancient proverb that those whom the gods intend to destroy they first make mad. In accordance with it, the automobile industry should be able to draw the happiest augury from the wild, misleading, exaggerated, and wholly disingenuous statements and misrepresentations which its enemies put forward in the columns of the public press, the evil of which, though they never seem to recognise it, recoils in reality upon themselves. As we have often pointed out, the Juggernaut is dead. He died from the ridicule which the ludicrous misrepresentations of his worshippers directed upon him. From time to time there have been more or less resolute attempts to resuscitate him, and whenever there is talk of further legislation, we generally witness one of these ill-starred efforts. At the luncheon which opened the Olympia Show, Lord Stanley referred to fresh automobile legislation when the present measure should come to an end, and almost immediately there sprang, if not into life, at any rate into renewed activity, the "Highway Protection League." We have referred before to the objects of this precious association, which, while pretending to defend the rights of ordinary road users, are in reality to carry on an embittered campaign against automobilism. Their most recent effort is worthy of their record. In an advertisement page in one of our morning papers, they advertise their propaganda by a reproduction of what looks like one of the most recent racing cars of one of our most celebrated English firms—a car which has broken world's records on the Florida Beach, and which has the peculiar characteristic, for a racer, of being capable of being driven along even the London streets at the slowest pace of that proverbially funereal traffic without noise and with perfect control. In addition, this type of car is controlled by drivers, who, almost more than any other class, are notoriously considerate of other road users, and any of whom would probably risk wrecking his finest automobile rather than run over the most contemptible yapping cur. Above all, it has never been suggested that the racing car illustrated has ever been driven at high speed on English roads, and to put forward a reproduction of it under such circumstances amounts, in our opinion, not only to a virulent libel, but is hitting below the belt in a way which must make all

right-thinking Englishmen who are acquainted with the facts shrug their shoulders in amused contempt. We are entertained at seeing, from correspondence which has appeared in the *Pall Mall Gazette*, that the "Highway Protection League" is establishing branches in all parts of the country. One of its most enthusiastic supporters appears to reside at Hellingly, in Sussex. The choice of residence is appropriate, for there are few more isolated and bucolic corners of the country than this same Sussex village, and, that the propaganda of the league should have there made one of its earliest and most enthusiastic converts, is not a little amusing. Even our least progressive villages have usually a strong sense of fair play. "But," as Carlyle observed, "there are causes in which even Satan himself bringing help would be welcome!"

♦ ♦ ♦ Against Sub-dividing Exhibitions.

THE Society of Motor Manufacturers and Traders are sending out a circular to their members, supporters, and the trade generally, setting forth their policy as to shows, which is obviously designed to counteract the effect of certain proposals which have been put forward for splitting up the great automobile show of the year, and holding separate exhibitions of heavy vehicles, motor boats, and the like. We reproduce their statement elsewhere, and, from this, it will be seen that the Society is nailing its flag to the mast of concentration, and in this respect it is, we think, acting very wisely. One has only to consider what kind of a show at the present time an exhibition consisting wholly of heavy vehicles, tractors, heavy luries, whether steam or petrol, and their attendant trailers, would be like, or a similar exhibition at Olympia, or any capable building, consisting solely of motor boats would be, to see the futility of such suggestions. On the contrary, it is to the benefit of everybody, at any rate at present, that all exhibits should be together. Then, the municipal engineer, who goes to inspect the heavy lurry, may find his fancy taken by a light pleasure car, and buy one. The man who goes to view the latest developments in steam or petrol touring cars may on seeing the exhibition of motor boats, which is provided in the same building, recognise that aquatic automobilism has attractions not less seductive than those of automobilism on the road, and may go home the purchaser of a motor launch. Concentration and centralisation as regards exhibitions, obviously, spell general prosperity. The greater number of features of varying interest that are collected under the one roof, the greater will be the total number of visitors, and the larger will be the number of orders booked, and the greater will be the general benefit to the trade.

♦ ♦ ♦ The Brief for the Electric Tram.

WE cannot help admiring the pertinacious way in which the electrical papers are rushing to the support of the electric tram against the threatened competition of the motor bus. It is quite right of them to do so, and we admire them for it. The tram contractors and ouliders are their supporters, and naturally the papers which they so liberally support rush to their defence. There are many of these undertakings, too, whose shares have a certain market value, which it is desirable to maintain as high as possible. Hence, it may be that the elaborate articles now being poured forth on the subject are not always as unprejudiced as they should be in a scientific discussion. Some time ago, our readers will remember some rather futile experiments were made

in the good town of Perth, not, in spite of its historical traditions, exactly the spot one would select as a site of the most recent automobile triumphs. The Corporation had ordered a locally-built motor omnibus to run on the tramlines of the town. The motor omnibus was a dead failure, and the scheme was abandoned. This unfortunate example is being represented by one of our electrical contemporaries as a proof that petrol-driven tram vehicles cannot be run on existing horse tramlines. When the recognised champions of the electric tram are driven to such disingenuous inferences as this in support of their case, it is a sufficiently eloquent indication of the weakness of their cause, and the dread they entertain in regard to the impending competition of the motor 'bus.

The Lighting of Vehicles Bill.

THE Motor Union has fulfilled its promise, and has now got out the text of a Bill for making the lighting of all vehicles throughout the country compulsory, with the object of preventing the safety of motorists, and other users of the road after dark, being dependent on whether local authorities have seen fit to pass any bye-laws on the subject, or whether they enforce such bye-laws as exist. The Bill is a short, comprehensive, and business-like measure. It provides not only for the carrying of lamps on the right-hand side of vehicles, showing a white light in the direction in which they are travelling, but also for the display of a red light to the rear. In the case of vehicles such as timber carts, or others the loads of which may stick out a long way behind, and which, as has been frequently proved, are a source of very considerable special danger, the Bill wisely provides that an extra red lamp shall be attached to the extreme rear of such projections. The National Cyclists' Union has for many years had a lighting measure before Parliament, but though an excellent measure in itself, that proposed measure fell short of the Motor Union Bill in two very essential particulars. It did not provide for a red light being shown behind, and did not provide for a light carried at the rear end of projecting loads. The National Cyclists' Union Bill has hitherto not been successful in obtaining Parliamentary attention. It is to be hoped that the Motor Union measure will meet with more satisfactory treatment. The Parliamentary support which the Motor Union, backed by the Automobile Club, and favoured by the allied cycling organisations, can command, is very much greater than that which has hitherto been at the disposal of the National Cyclists' Union. This, coupled with the fact that the Bill itself is a much more useful measure, and that the growth of automobilism has opened the eyes of the public and Members of Parliament in particular to the dangers of unlighted vehicles on our roads to a much greater extent than has ever been the case before, should prove effective in ultimately securing its passage through Parliament. At the same time, it must be remembered that everything is against the chances of a non-Government measure of this kind being afforded Parliamentary time, under prevailing circumstances. We cannot therefore too forcibly impress on all Members of Parliament interested in automobilism, and on all persons who have influence with Members of Parliament, to use their utmost endeavours to enlist Parliamentary support on behalf of the proposed Bill.

For Travelling on the Continent.

WE have all known, for a long time, that there is no more delightful method of travelling from one end of Europe to another than by means of a high-powered

automobile, particularly when you have plenty of money to spare. But there appear to be very strong reasons indeed for believing that the delights of automobile travel are, in the future, to be by no means confined to the man who is able to own and keep up, say, a 40-h.p. Mercedes, or to pay the hotel bills which are associated with such a system of living. We refer to a recent highly suggestive article which has appeared in the *Daily Mail*, pointing out that a moderate powered automobile, combined of course with management and common sense, provides not only the pleasantest, but the cheapest, means of travel from one end of the Continent to the other. Three travellers set forth as passengers on a small 8-h.p. car. Their luggage was simple, consisting solely of two Gladstone bags and a large number of overcoats. With this equipment they crossed from Southampton to Havre, and from there ran down to the South of France by the celebrated road passing through Melun, Macon, Orange and Aix, to Marseilles, and from there on into Italy by way of Cannes and Mentone, crossing the Maritime Alps, and arriving in the most classical portion of the plains of Lombardy. They came back by much the same route, and in spite of sojourning on the way in the best class of hotels, the cost of the travel for each of the three travellers for this splendid tour amounted to under £18 each. This is a testimonial to automobile travel which can hardly be over-estimated, and ought unquestionably to have a most beneficial effect on the market for the smaller and cheaper classes of vehicle.

The Diesel Engine in a New Sphere.

WHEN the Diesel engine was first brought before the public, great expectations were not unnaturally entertained as to the possibilities of applying it to automobile propulsion. These expectations have from various causes not as yet been realised. The Diesel engine presents great possibilities. It consumes practically any kind of fuel and has a great flexibility, from both of which points of view lorry builders and engineers, concerned with the design of the heavier classes of automobile vehicles, have always kept an eye upon it. The fact that it has not hitherto been successfully applied to self-propelled traffic is perhaps mainly due to the weight of flywheel necessitated, and to the difficulties of starting involved by the high degree of compression at which the engine necessarily works, and of the consequent need for compressed air storage for starting it. The Diesel engine, however, has, it is now reported, been successfully applied to locomotive propulsion in the United States. The locomotive itself appears to be something on the Heilmann principle, that is to say, the engine is employed to operate a dynamo which in turn supplies electric current to motors geared to the driving wheels. In the particular locomotive which is now, we understand, running on the Southern Pacific Railroad, a 4-cylinder Diesel engine is employed, and is at present running on crude petroleum oil from the wells. Of course, it is a long way from a locomotive to a motor car, and it is possible that the Diesel engine may possess peculiarities which suit it for locomotive propulsion, even though the difficulties that have up to the present stood in the way of applying it to automobiles may not be got over, but the successful adaptation to the locomotive would certainly seem to indicate the possibility of its being so adapted at any rate to the heavier classes of self-propelled vehicles, a result which might have a very beneficial influence on the future of this important branch of the industry,

THE OLYMPIA EXHIBITION OF 1905.

(Continued from page 250.)



AT OLYMPIA.—View of the Electromobile Company's Petrol Landulette, which is fitted with a 4-cylinder vertical Napier engine beneath the front seat.

"Popular" Touring Cars.

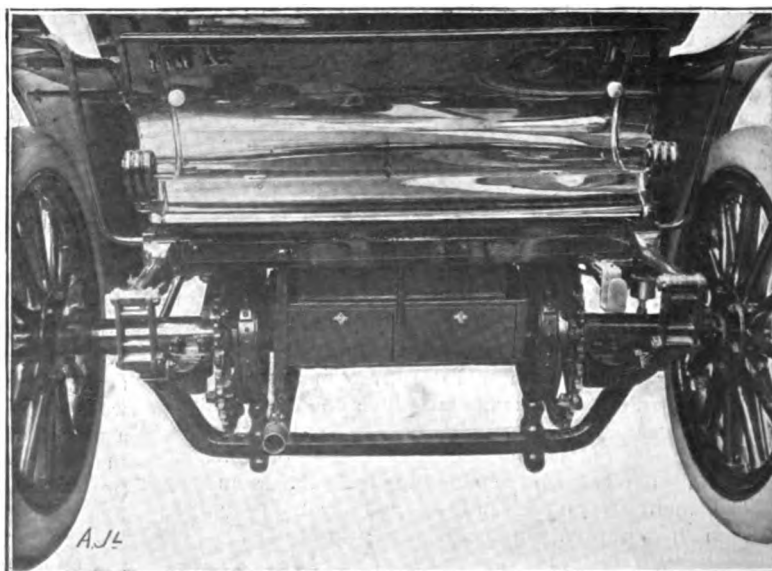
Under this heading we propose to include the more interesting of those vehicles which do not greatly exceed £200 in price, and most of which are below that figure; it must not, however, be concluded that all cars of this kind are necessarily referred to, because they happened to have been at Olympia. Those which have special merits, or are noteworthy in view of their originality, naturally include the two 6-h.p. models with which the names of Wolseley and of Siddeley are already so widely associated; at this Show, the horizontal engine type was exhibited with quite a variety of useful, of comfortable, and even of handsome bodies, showing how very serviceable and reliable a little car of this kind can be—while the new vertical engine model (that was fully described in our columns the week before last) was represented by a finished chassis on the Siddeley stall. Other British vehicles of this class, include the 7-h.p. Swift and the 8-h.p. Singer, both of which have 2-cylinder engines, and have been dealt with in special articles in one or other of these "Show" numbers, and the Rover 8-h.p. single-cylinder vehicle which made its first appearance at the Hereford small car trials last year. Also at those trials were the Alldays, the Enfield, and the Chambers' vehicles, each of which in its latest form was prominent at Olympia.

The "Alldays" single-cylinder vehicle is either fitted with a 7-h.p., or with an 8-h.p., engine, and is supplied as a two-, three- or four-seater. The "Enfield" has a twin-cylinder engine, and is of a new design since last year, for it has a pressed steel frame, a flexible propeller-shaft—like that on the 4-cylinder model—and the engine gives 10 b.h.p. The "Chambers" light car is of very original construction throughout, having a twin-cylinder horizontal engine in front, a three-speed and reverse gear arranged on the back axle, and a single enclosed chain for transmitting the power from the former to the latter.

As a two-seater or a three-seater—and it is readily convertible from one to the other—it has a 7-h.p. engine, but a larger 10-h.p. type is also made, in which the same gear is mounted on a countershaft instead of on the axle, and the road wheels are driven from it by side-chains. These "Chambers" vehicles were shown by Messrs. Alford and Alder, who are the makers' London agents, and make a special feature

of building bodies suitable for the use of commercial travellers.

Quite a new light car was that shown by Messrs. James and Brown. It has a twin-cylinder horizontal engine, the cylinders of which are on opposite sides of the crank-shaft, and have their valves operated by a single, diagonally-placed cam-shaft, which is driven by



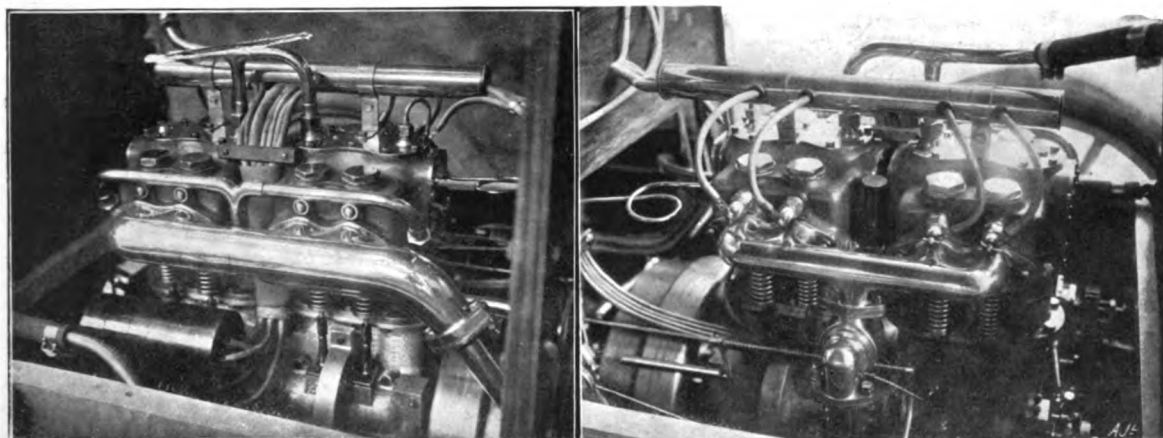
AT OLYMPIA.—Rear view of the Electromobile Petrol Landulette, showing the U shaped back-axle—which allows the chains to be placed inside the main frame—and the semi-elliptic springs which are fixed beneath the axle centre.



AT OLYMPIA.—The 20-h.p. Wolseley Delivery Van, built for the Great Western Railway Company; the Chassis is identical with those employed for the Wolseley Motor 'Buses.]

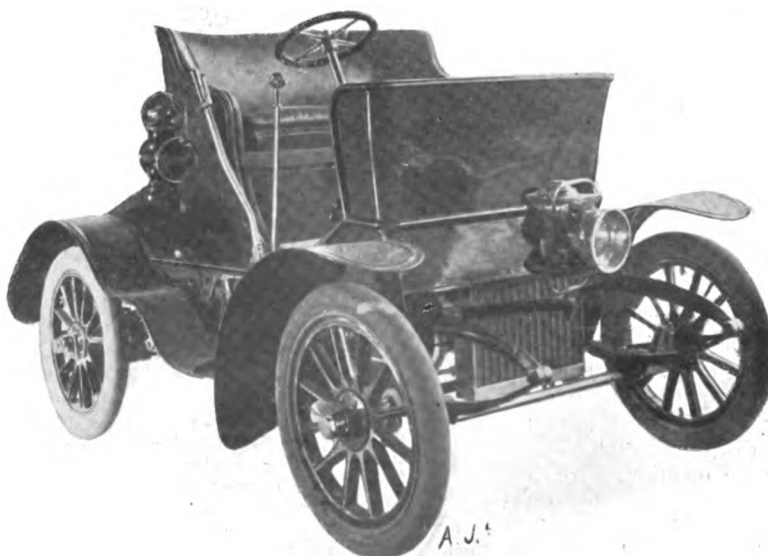
is transmitted to a live -rear-axle by a propeller-shaft.

Another new comer, in the way of low-priced cars, is the Adams-Hewett, in the design of which, the well-known characteristics of the already very popular Oldsmobiles—and similar American types of light vehicles—have been to a great extent followed. It has a 9-h.p. single-cylinder engine, the normal speed of which is 900 revs. per min., and this is fitted with a low-tension magneto ignition system, as well as with a high-tension battery system; the entire driving-mechanism constitutes a separately detachable unit, the gear has no internally-toothed wheels, an automatic system of forced lubrication has been adopted, and wheel-steering is employed. Of the well-known American models, neither the Oldsmobile nor the Cardillac—both of which were as usual well in evidence—need further description in this report, since our readers already know the details of their construction, and are acquainted with their many excellent features. The three Oldsmobile types

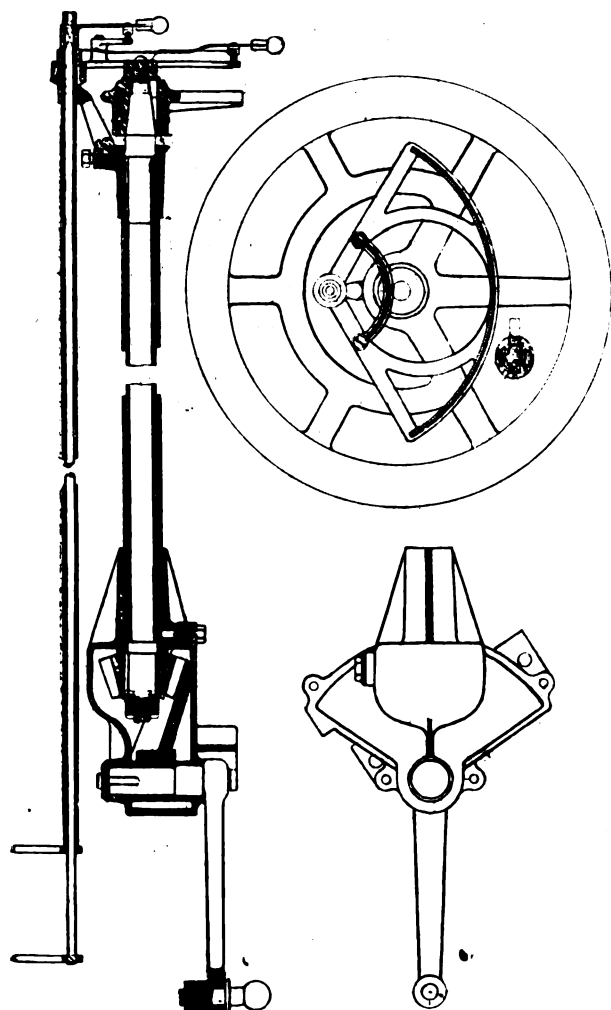


AT OLYMPIA.—Views from either side of the 4-cylinder engine fixed in place in the 14-h.p. Swift Car.

skew-gearing from the crank-shaft. The engine is fixed almost centrally in the pressed-steel frame, with its crank-shaft lying transversely, and with a final single-chain drive from it to the live-axle. Between the engine and the sprocket, are introduced a metal-to-metal clutch, and a change-speed-gear of the sliding-spur-wheel type giving three speeds and a reverse, with a direct-drive on the top speeds. Another novelty is the Hitchon-Weller 9-h.p. model, which has, combined with the single-cylinder vertical engine in front, a neat gear-box of the sliding-spur-wheel pattern. The special feature of the gear mechanism is that the wheels in the gear-box have free-wheel clutches to allow them to over-run their shafts, this provision rendering changing of speed more easy, as was described in our issue of February 27th, 1904; the power



AT OLYMPIA.—The 8-h.p. 2-seated Singer Car, of which we gave full particulars three weeks ago.



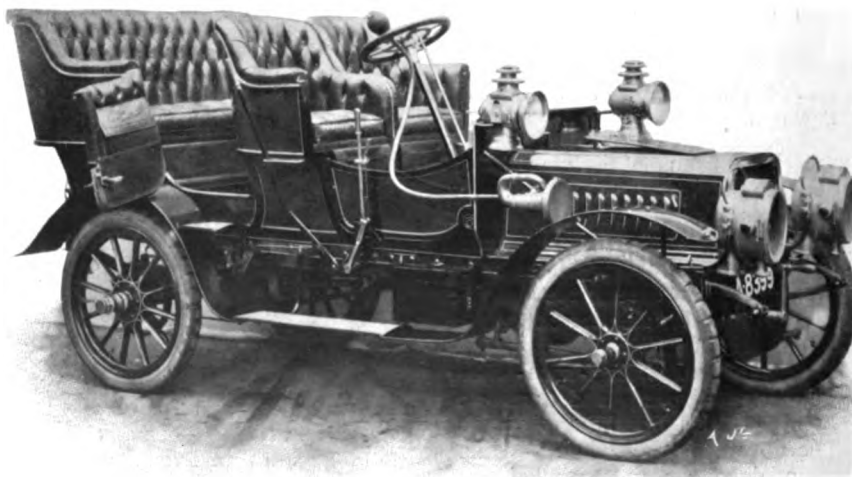
AT OLYMPIA.—Transverse section, plan and side elevation of the steering-gear on the 15-h.p. "Orleans" car. This mechanism has a bevel-pinion meshing with a correspondingly toothed quadrant, and the steering-wheel is so shaped that the small hand-levers, regulating the speed of the engine, lie above it, although the spindles carrying them pass down outside the steering-pillar.

to which we referred in our issue of the 11th inst. were all on view, and the only new points connected with the Cadillacs were the greatly improved types of body that are being fitted to them this year.

Although so well known already, the De Dion "Populaire," which still has individual clutches in the gear-box for introducing the different speeds—although all the larger models now have the new single-disk main-clutch—must certainly be mentioned, for it is still one of the best made light cars on the market. The 6-h.p. Mobile and the 9-h.p. Prosper-Lambert are both types which competed at Hereford last year, and have both, since

then, undergone considerable improvement. The Mobile Engineering Company, of Birmingham, also have a twin-cylinder car of 8-10-h.p., which comes within this "price" category, in addition to the more costly 10-12 and 24-30-h.p. vehicles shown on their stall. The 6-h.p. is a two-seater, and has a De Dion engine; the 8-10-h.p. is a four-seater, and has an Aster engine; both of them are of the live-axle type, and both have three forward speeds and a reverse. The 9-h.p. Prosper-Lambert chassis has a pressed-steel frame, and its single cylinder vertical engine, which is governed on the inlet, has a variable-lift, mechanically-operated inlet-valve. Natural circulation takes place between the cylinder-jacket and the radiator, and the latter is cooled by a fan. The 10-12-h.p. 2-cylinder car, made by the same firm, is of similar construction, and either of these strong and well-built vehicles can be fitted with two-seated bodies or with tonneaus.

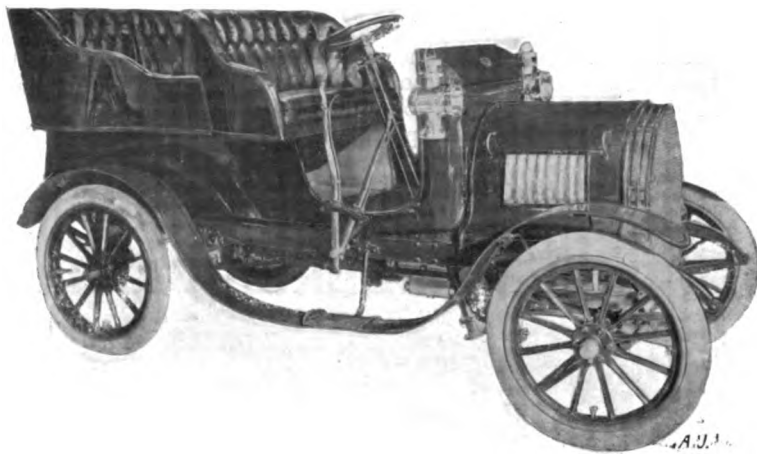
Of other Continental cars of low power, and low price, having special features of construction, the Cottureau 8-h.p. Populaire models, and the 7-9-h.p. Dixi proved to be well worth attention. The little Cottureau vehicles, which, it will be remembered, have a single chain connecting the gear-box with the live-axle, are now supplied either with the single-cylinder engine, or with one of the same power having two cylinders. The small Dixi car has a tubular frame, and its single cylinder vertical engine has its mechanically-operated inlet-valve mounted centrally in the cylinder head—this being controlled by the same transverse cam-shaft that actuates the exhaust-valve in front. The engine, as also the complete chassis, are illustrated by us this week, where it will be noticed that the gear-box is carried at its rear end by the live-axle, and that the power is transmitted to it by a universally-jointed propeller-shaft. The engine has a bore of 110 mm., a stroke of 130 mm., and there are



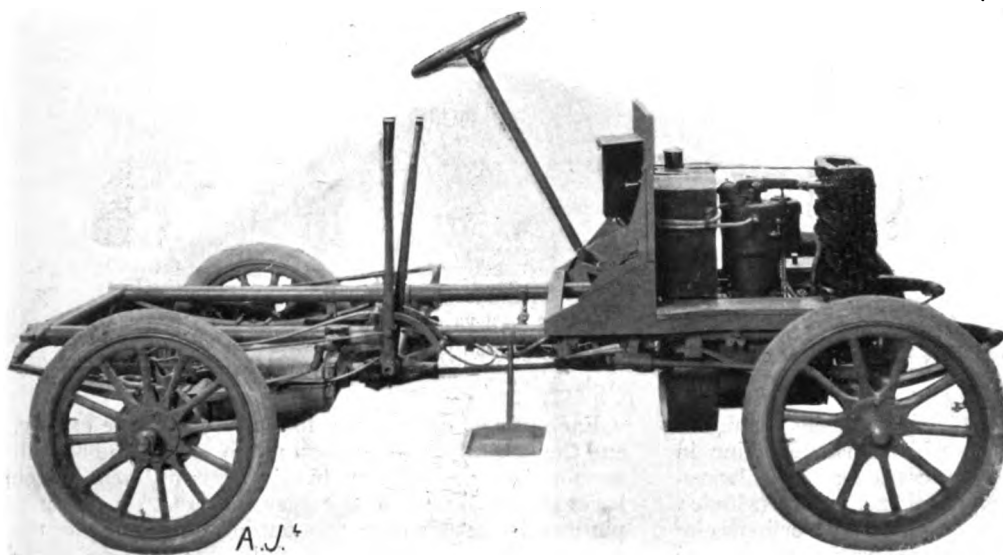
AT OLYMPIA.—The 15-h.p., 1905, "Orleans" car, the more interesting features of which are that the 4-cylinder engine is rigidly fixed to the special gear-box (employed by these makers), that the leather-faced cone-clutch is made in such a way—in two halves—that the inner member can be easily removed without dismantling any other part, that special cardan-joints are employed for the propeller-shaft, and that the live-rear-axle carries the road wheels on stationary trunnions instead of upon the revolving-shafts. The cylinders are separate, have a bore of 90 mm., a stroke of 110 mm., and give 15-h.p. at 1,000 revs. per min. The engine has atmospheric inlet-valves, and a range of speed of from 200 to 2,000 revs. per min. The car is very speedy, and is an excellent hill-climber.

two high-tension ignition-plugs fitted, in series. The frame is made from 2-in. cold-drawn steel tubing, and—like its larger sister—has no brazed joints. Two speeds and a reverse are available.

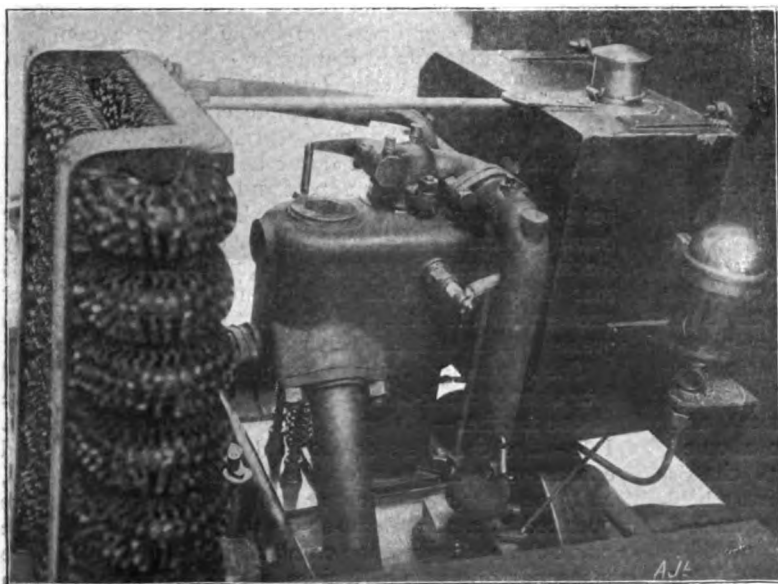
Of even lower price than those which we have just dealt with, is the new 6-h.p.—one hundred guinea—Kover car, of which we gave some particulars in connection with the recent exhibition in Birmingham. Other four-wheeled cars, having “proper” carriage bodies, and marketed at but slightly higher price, include the 6-h.p. Speedwell, and Messrs. Hall and Company's Liliput—to the latter of which reference was made in connection with the exhibition at the Crystal Palace, last month. The little Speedwell car, a fortnight ago illustrated by us, is of similar general design to the 9, 10, and 12-h.p. models which have also been put on



AT OLYMPIA.—The Twin-cylinder 10-h.p. Enfield Light Car, fitted with a Tonneau body.



AT OLYMPIA.—Side view of the single-cylinder 7-9-h.p. Dixi Chassis, which has a tubular main frame, and the gear-box combined with the live-rear-axle.



AT OLYMPIA.—View of the Single Cylinder Engine on the 7-9-h.p. Dixi Chassis, showing the mechanically-operated inlet-valve in the centre of the cylinder-head, and the new type of Carburettor that is employed.

the market by the Speedwell Motor and Engineering Company—all at very reasonable prices.

There yet remain but two other extremely low-priced vehicles, to which reference might be made. These differ considerably both in construction and in external appearance. The 5-h.p. “Minervette” costs slightly more than £100, and the 4-h.p. “Orient Buckboard” slightly less, while the former is almost as typical of European, as the latter is of American, design. The “Minervette” has a single-cylinder vertical engine fixed transversely in front, with a change-speed-gear that is operated by jaw-clutches—combined with it. When on the top-speed—there are two forward speeds and a reverse—the power is transmitted direct from the crank-shaft to a friction-clutch on the countershaft; the clutch is connected by another

chain with the live-axle. The main-frame is of tubular construction, and the wheels are of the wire-spoke type. The "Orient Buckboard" is nothing more nor less than a "buckboard," for the double seat is merely fixed on a large flat platform. The single-

cylinder engine is carried just behind the axle, and a gear, giving two forward speeds and a reverse, is combined with it, the power being transmitted to the differential by spur-gearing.

(To be continued.)

THE 1905 GOBRON-BRILLIÉ PETROL CARS.

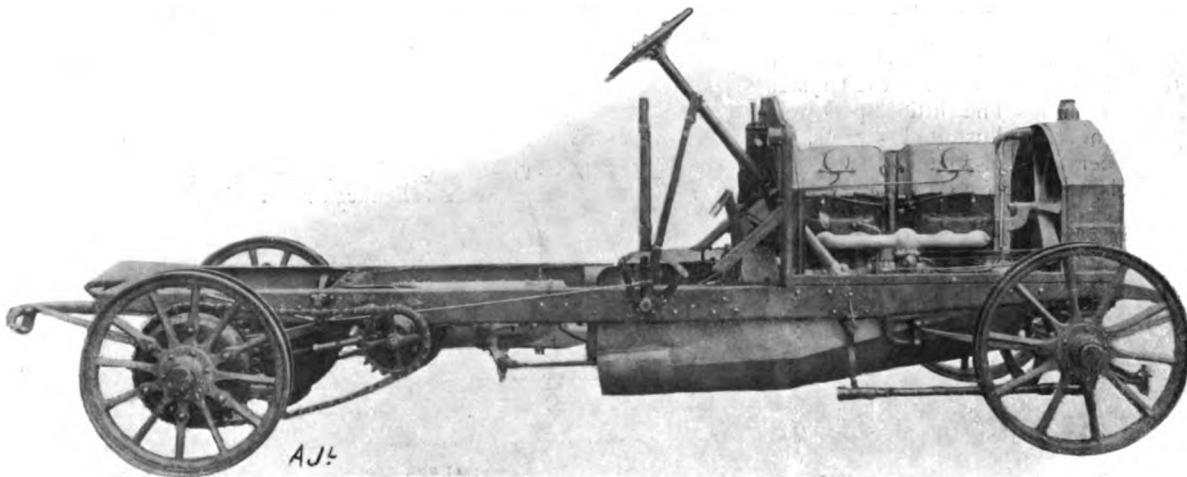


Fig. 1.—Side view of the 4-Cylinder Gobron-Brillié Chassis.

INDEX

As our readers are already aware, the chief distinctive feature of the Gobron-Brillié vehicles is the engine, in which the forces exerted upon the crank-shaft are balanced by employing two pistons, instead of one, in each cylinder. Both this year's models have four double cylinders of this kind, and are, in consequence, particularly smooth running vehicles. They have, too, many other excellent points, and they rank amongst the best that are produced in France. The two models—which have engines of 25-h.p. and 35-h.p. respectively—are of identical design throughout, except so far as dimensions are concerned, and in all main essentials they resemble the 4-cylinder car that we described on the 12th March last year.

The 1905 chassis is shown, from the right side, in Fig. 1, and a view from the back—in which are visible the regulating levers and pedals, as well as the clutch and gear-box—is given in Fig. 2. In Fig. 3, the engine, removed from the chassis, is shown from the left side, and, in Fig. 4, is reproduced a photograph of the change-speed-gear. As will be noticed, the car is of the chain driven type, and has one of those "one-piece" pressed steel frames of which we gave illustrations on January 16th last year. The frames are made sufficiently long to accommodate bodies having side entrances, and, in consequence of the method of construction adopted, they are extremely strong. Either the 25-h.p. chassis, or the 35-h.p. model, is built with an 8 ft. 6 ins. wheel-base, or with a 7 ft. 9 ins. wheel-base; and the track is 4 ft. 6 ins. Very long side springs are fitted; and those at the back lie outside, instead of beneath. All four wheels are mounted upon ball-bearings on the very substantial axles. Either 880 mm. or 920 mm. tyres can be provided.

Each pair of cylinders is formed by a single casting, and the general principle upon which the engine is built remains the same as formerly. The arrangement of the lower pair of pistons, so that they act direct on a crank-pin that lies between the two outside crank-pins, for the two upper pistons, was very fully described by us in September of 1903. It will be remembered that the upper pistons—which reciprocate in the opposite directions to the lower ones—are connected by a common yoke with the two long connecting-rods that pass down inside the cylinder-casting (at each end), and that these connecting-rods act upon separate crank-pins, which are placed opposite to the long central crank-pin. In this way, the explosions that occur between the upper and lower pistons, force them apart and cause them both to act simultaneously on the crank-shaft, the one pair by driving its crank-pin downwards, and the other pair by forcing its crank-pin upwards. A further feature, too, is that the upper pistons are given a somewhat shorter stroke than the others, in order to compensate for the greater weight of their reciprocating parts.

The 4-cylinder engine consequently has two long and four shorter crank-pins, the former—which are opposite to one another—having a greater throw than the latter. Inlet-valve chambers are formed on the right side, and exhaust-valve chambers on the left side of the cylinders, and the valves—which are all interchangeable—are operated by a pair of cam-shafts that are enclosed in the crank-chamber, while the crank-chamber itself has large inspection doors on both sides. The valves are fitted in exactly the same way as on most other engines, with inspection plugs above them, and the valve-chambers—as well as the cylinder-walls—are thoroughly well water-

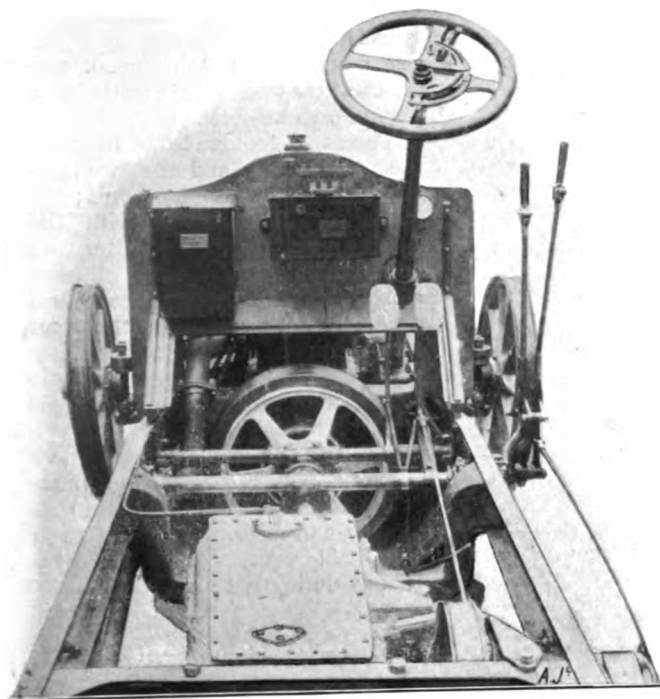


Fig. 2.—View of the central portion of the Gobron-Brillié Chassis, from the rear.

jacketed. Corresponding with the crank-chamber beneath, the cylinders have neat aluminium casings above them, these upper casings completely enclosing the upper portions of the long connecting-rod together with the yokes and pistons. The total stroke of the two pistons in each cylinder is 190 mm., and the bore is 90 mm. and 100 mm., respectively, for the 25-h.p. and 35-h.p. engines. At a speed of 1,200 revs. per min., the b.h.p. is 35 and 42, respectively.

The carburettor, of which we have already given a full illustrated description, is practically unchanged since last year. It is fixed on the right side of the engine, and it has its throttle-valve interconnected with a sliding cone that encircles the spray-jet; the cone tends to maintain a constant richness of mixture, by varying the velocity of the air that passes the jet. The power of the engine is controlled entirely by the driver, from the two small hand-levers above the steering wheel, or from the foot accelerator; one of the levers regulates the throttle-valve, and the other varies the "time" of ignition. The petrol tank is fixed beneath the seat, and provision is made for relieving the pressure on the exhaust-box.

Primarily, the high-tension magneto, which is seen in Fig. 3, is employed for use with the ignition plugs, but a supplementary system is also provided by an accumulator, a trembler coil, and a commutator on the cam-shaft. The magneto is fitted to the crank-chamber on the left side, where it is driven by gearing as seen.

Even when the supplementary ignition system is in use—either system can be brought into play by a two-way switch on the dashboard—the high-tension distributor on the magneto is still made use of, and the same lever above the steering wheel serves to "time" the spark.

The circulating pump is also fixed to the crank-chamber on the same side as the magneto. It is driven by a pair of gear wheels from the magneto shaft. Sufficient water for the cooling system is carried by the radiator, which forms the front of the bonnet, and this is kept cool by a belt-driven fan, mounted just behind it, as well as by the flywheel, which has fan-blades inside it. The engine is, of course, completely enclosed on the under side, and the easily detachable bonnet is rendered air-tight.

Not only has the main clutch a large leather-faced cone, which is made to engage with a corresponding conical face turned inside the rim of the flywheel, but this cone also carries a smaller metal cone, which comes into engagement with its own external member before the larger cone does so. The smaller cone normally projects about 2 mm. forwards, and is held in this position by six small springs. As soon as the clutch-pedal is released, the metal cone therefore comes into operation first, and, since it runs in oil, is able to slip slightly and give a very soft starting action. When the pedal is fully released, the leather cone comes into action also, and ensures a total absence of all slipping.

As will be seen from Fig. 4, which is a view of the gear-box from above—with the upper portion removed—a direct-through-drive is obtained on the top speed from the clutch to the bevel-pinion. The other three forward speeds, and the "reverse," result from sliding the same sleeve along the "driven" shaft, for its gear-wheels are alternatively brought into mesh with corresponding wheels on the lay-shaft—which revolves whenever the engine is running; the intermediate wheel for the "reverse" gear lies beneath the lay-shaft as seen in our illustration. The car

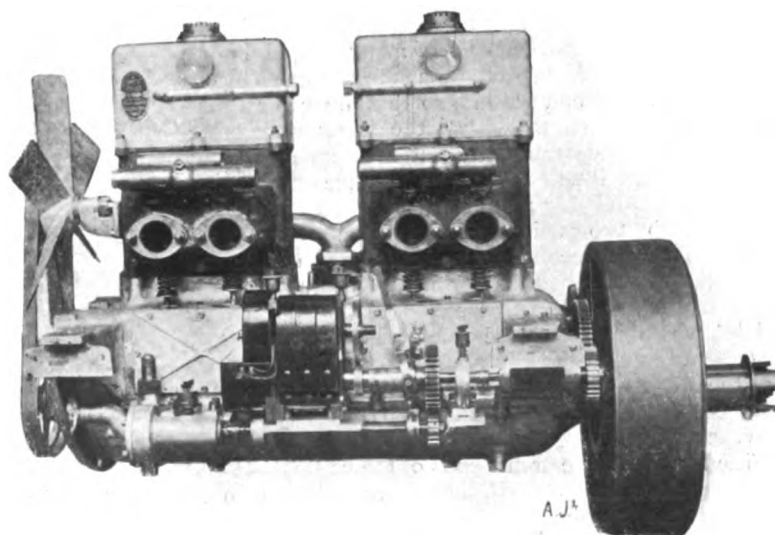


Fig. 3.—The 4-cylinder Gobron-Brillié Engine from the left side, showing the Exhaust-Valves, the Magneto, and the Water Pump; this engine has eight pistons.

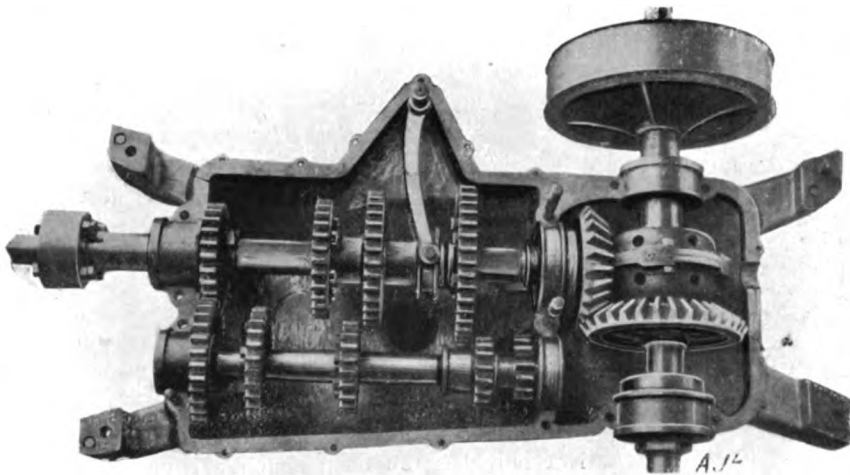


Fig. 4.—The Gobron-Brillié Change-Speed-Gear from above, with the upper portion of the gear-box removed; four forward speeds, and a "reverse" are available.



THE 1905 DAIMLER CARS

(Continued from page 257.)

The Change-Speed-Gear.

THE Daimler gear-box is of a distinct type of its own, although it works on the usual sliding spur-wheel principle, and has its sliding members controlled in much the same way as on a Mercedes car. The main differences are that the differential countershaft passes through the front, instead of the back, of the gear-box, that the first-motion-shaft lies beneath the countershaft, and that the entire box is fixed to the main frame at three points only. Another feature is that the brake pedal on the car acts upon two brake-drums that are fitted just inside the sprocket-wheels on the countershaft, instead of upon the shell of the differential-gear, and that thus the entire gear can run in an oil-tight casing, which extends right along the countershaft up to the brake-drums. The gear is well shown by photographs in Fig. 10, and by a longitudinal section in Fig. 11; in the centre of Fig. 10 it is shown complete from the *back* end, and, in the upper view, it should be noted that the countershaft has been turned round end for end, so that the central casting, H⁸, is seen from the *front*; the lower view corresponds with the central view, but the upper casting, H, and the base casting, H¹, have both been removed.

Between the two castings, H and H³, are carried the bearings for the second-motion-shaft, J, and for the differential countershaft, J¹, while in the top of the former casting, are the two large inspection covers, H¹ and H², which lie above the differential-gear, and above the second-motion shaft, respectively. The bearings for the first-motion-shaft are carried between the castings, H³ and H¹, and all the bearings are of the D.W.M. ball type.

Fitted round the extreme ends of the castings, H and H³, are the two brackets, H⁵, that are bolted to the main-frame of the chassis, and, pivoted to the back end of the casting, H³, is the eye-bolt, H⁶, that is fixed to one of the cross-members of the frame. The castings, H and H³, form kind of trunnions inside the brackets, H⁵, so that—in conjunction with the eye-bolt, H⁶—the entire gear-box is rendered absolutely self-aligning.

is usually geared to about 48 miles per hour on the top speed, and all the gear-wheels are made of 6 per cent. nickel-steel.

The usual foot-brake is fitted on the countershaft, and the two hub-brakes are operated by hand; the former is interconnected with the clutch-pedal, but the latter are quite independent. They all have metal-to-metal friction surfaces, and those that act direct upon the road wheels are of internal expanding type. As will be seen, the whole of the transmission mechanism is fitted with ball-bearings.

The touring cars that we have just described are designed on practically the same lines throughout as the 100-h.p. racer, with which such remarkable records were made by Rigolly during last year.

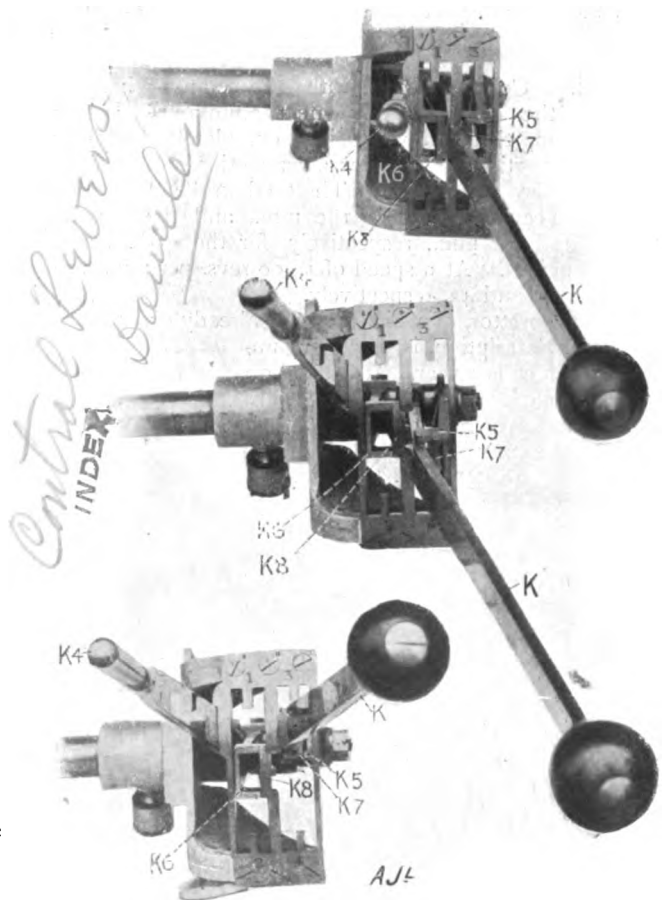


Fig. 12.—Three Views of the Daimler Change-Speed-Lever, and of the "Reverse" Lever, together with the Quadrant in which they work. In the first view both levers are in their neutral positions; in the second, the lever, K, is in the 4th speed position, and the lever, K¹, in the "ahead" position; while, in the third view, the lever, K, has been moved into its 3rd speed position.

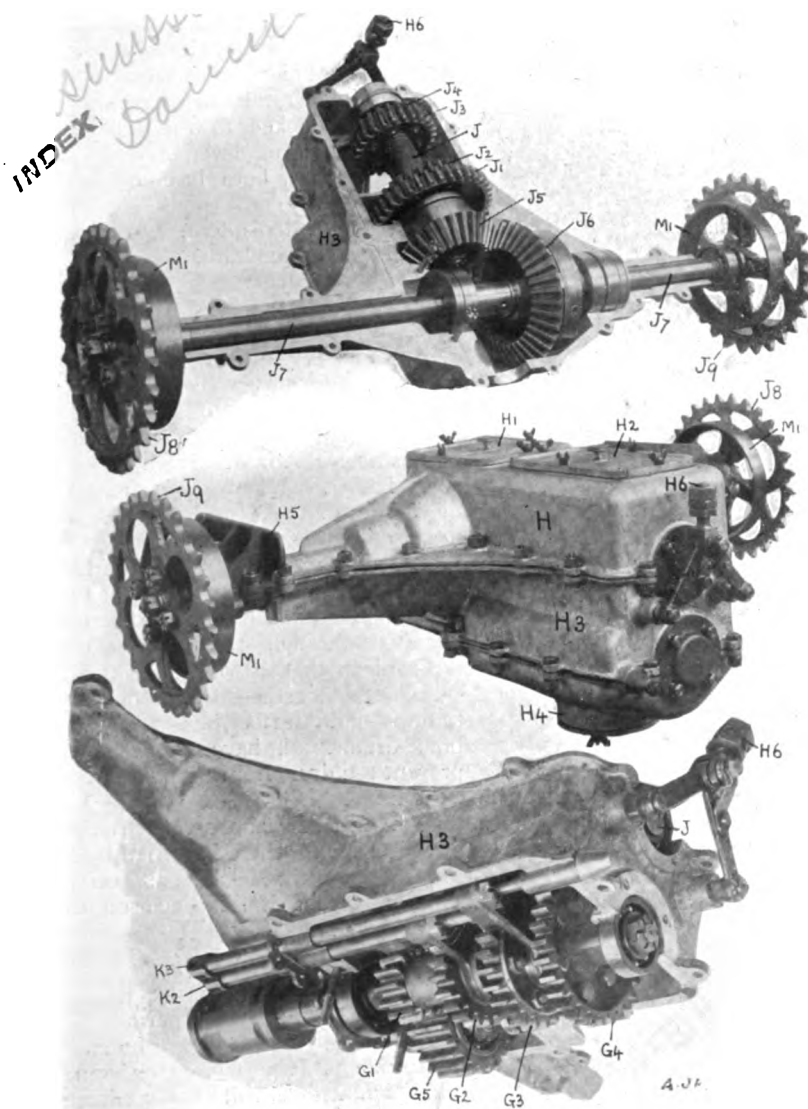


Fig. 10.—The Daimler Change-Speed-Gear. The upper view is of the intermediate portion, and is taken looking down upon it from the front; the central view shows the complete box from the left, and from behind; and the lower view corresponds to a certain extent with the central view, though the upper casting, and the base casting, have both been taken off.

The first-motion-shaft (which is driven through a flexible coupling from the clutch-shaft, G) has a square cross-section inside the box, and, on this, are free to slide, independently, the two wheels, G¹ and G², and the two wheels, G³ and G⁴; these wheels represent the 1st, 2nd, 3rd and 4th speeds respectively. The one pair is controlled by the sliding-rod, K², which carries a fork engaging with them, and the other pair is similarly controlled by the rod, K³, these two rods being connected through independent sleeves with independent

lever-arms (K⁵ and K⁶), which lie on opposite sides of the change-speed lever, as will be seen presently. Fixed rigidly to the second-motion-shaft, J, are the four spur-wheels, J¹, J², J³, and J⁴, which correspond with those (K¹, K², &c.) on the first-motion-shaft, and there is also another wide spur-wheel, G⁵—visible in the lower view of Fig. 10—that acts as an intermediate "reverse" pinion, and can be slid into mesh with the wheels, G¹ and J¹, when they are in their neutral positions. The pinion, G⁵, is controlled by an independent hand-lever, K⁴.

The second-motion-shaft, J, drives the differential-gear in the usual way, by the bevel-wheels, J⁵ and J⁶, and the two sprockets, J⁷ and J⁸ (on the right and the left respectively), are fixed to the ends of the countershaft by four bolts, in such a manner that they can be readily removed, and others substituted—for altering the gear ratio—if required. The sizes of the spur-wheels inside the gear-box are so proportioned that there are almost exactly equal differences between the gear-ratios of each of the four successive speeds, this being found much more handy in practice than if the third-speed were higher in relationship to the second than the fourth were to the third—which is very often the case in other cars.

The manufacturers have a very fine equipment of accurate gear-cutting machinery, which enables them to manufacture correctly-proportioned wheels, and they also employ a special process of hardening, by which the teeth are rendered extremely tough, but not brittle. The wheels are, it will be noticed, both strong and large for the work they have to perform, and the two bevel-wheels, J⁵ and J⁶, are kept in proper mesh with one another by additional ball-thrust-bearings on

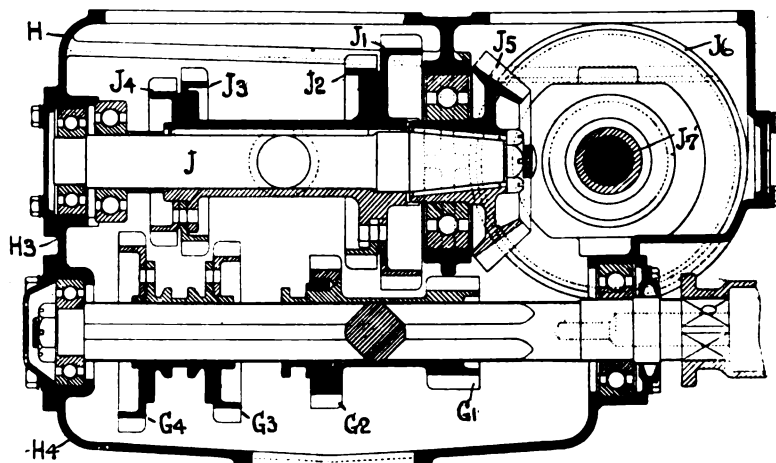


Fig. 11.—Longitudinal vertical section through the Daimler Gear-Box, showing the arrangement of the first-motion-shaft beneath the second-motion-shaft, and of the differential countershaft in front of the latter.

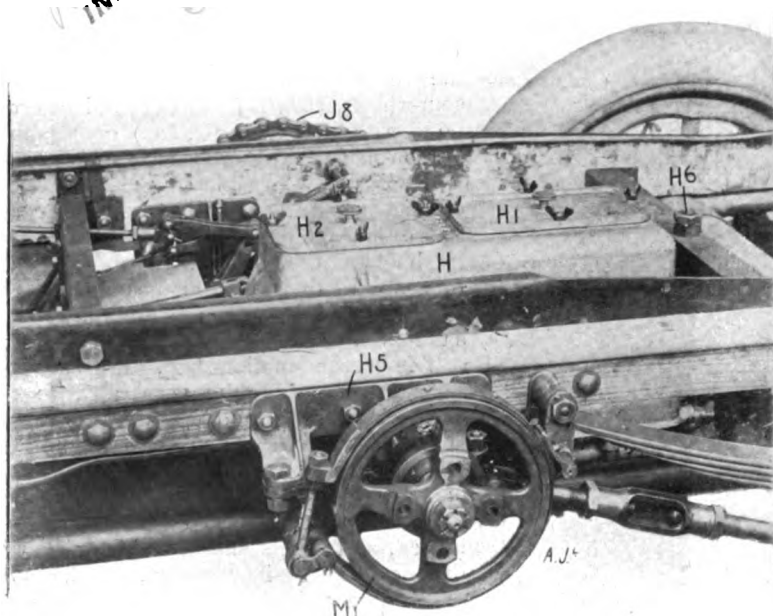


Fig. 13.—The central portion of the 28-36-h.p. Daimler Chassis, from the left, with the sprocket on that side removed to show the brake-drum on the countershaft.

their shafts. The gear-box, as well as the mechanisms between it and the engine, is well protected on the underside by a very neat metal casing, that can be readily detached, so that all these parts are prevented from becoming coated with dust or mud, even when the roads are in very bad condition.

The change-speed-lever, K, is very neatly arranged in such a way that it is impossible, even for the novice, to experience any difficulty in changing from one speed to another. This device is well shown in Fig. 12, in which the lever is seen in three different positions. The quadrant for the lever, K, has two alternative slots, in either of which it can be moved forward and backwards, and there is a central opening between them to allow the lever to pass across from the one to the other, when it is in its neutral position. The lever is mounted at its lower end freely about the shaft, and it has a hinge, introduced between the boss and the lever proper, to allow it to rock sideways. Fitted on each side of it, are the two lever-arms, K⁵ and K⁶, which are so shaped at their upper ends that the lever can fit into, and engage with either of them, when it is so moved. Both these lever-arms have flat spring-blades, K⁷ and K⁸, fixed to them, in such a manner that they tend to prevent the lever, K, from engaging with the lever-arms, and that they also tend to lock their respective lever-arms, K⁵ and K⁶, to the quadrant. The spring portions also have projections that can engage in slots formed in the sides of the lever, K, and thus the lever cannot be moved at all, from its neutral position, until it has been forced sideways into proper engagement with one or other of the lever-arms; it is seen in this position in the upper view of Fig. 12.

The lever-arm, K⁵, controls the "third" and "fourth" speeds, respectively, and the other lever arm, K⁶, controls the "first" and the "second" speed, so that when the lever, K, is moved outwardly and then drawn rearwardly—as seen in our central illustration—the "fourth" speed is introduced, and when similarly pushed forward—

as seen in the lower illustration—the "third" speed is brought into operation. It will be noticed that when either speed is in gear, the other lever-arm is left securely locked to the quadrant, and that when the lever, K, is in its central position, both lever-arms are locked to it. The "reverse" lever, K¹, is quite independent, and moves over a separate quadrant.

The Brakes.

A very good view is obtained of the countershaft brake on the "near" side in Fig. 13, for the sprocket-wheel, J², has been removed. It will here be seen that the brake-band is normally held clear of the drum, M¹, but that it can be tightened by a toggle system that also provides a convenient adjustment for taking up any wear. Both countershaft brakes are simultaneously operated through the compensating mechanism that is visible on the far side of the chassis—in the same illustration—and a further point is that the brake-drums, M¹, have no flanges to prevent the drum from being removed

without disturbing the band.

The rear brakes are of precisely similar construction. The compensating device, N², for them is carried by the transverse rock-shaft, N¹, beneath the axle, as seen in Fig. 3; this compensating mechanism is enclosed in a light casing on this year's cars.

Table of Reference Letters for the 18-28-h.p. Daimler Car Illustrations.

A	Carburettor.	M ²	Inspection cover above second-motion shaft.
A ¹	Combined throttle and timing hand-lever.	M ³	Intermediate casting of gear-box.
A ²	Petrol tank.	M ⁴	Base-casting.
A ³	Pressure-valve.	M ⁵	Brackets for attachment to main frame.
A ⁴	Induction pipe.	M ⁶	Swing bolt for attachment to transverse member.
A ⁵	Air-cocks in same.	J	Second-motion shaft.
A ⁶	Rod connecting throttle-valve with lever, A ¹ .	J ¹	Gear-wheels on second-motion shaft.
A ⁷	Throttle-valve spindle.	J ²	Revel-pinion on same.
A ⁸	Plug above spray-jet.	J ³	Bevel-wheel on differential countershaft.
A ⁹	Warm air inlet.	J ⁴	Differential shafts.
A ¹⁰	Cold air inlet.	J ⁵	Right-hand sprocket.
B	Circulating pump.	J ⁶	Left-hand sprocket.
B ¹	Radiator.	K	Change-speed lever.
B ²	Fan.	K ¹	Rods connecting K with gear mechanism.
C	Combined commutator and H.T. distributor.	K ²	Sliding-rod for first and second speeds.
C ¹	Ignition-plugs.	K ³	Sliding rod for third and fourth speed.
C ²	Battery-box.	K ⁴	Reverse lever.
C ³	Coil-box.	K ⁵	Lever-arm fixed to third and fourth sleeves.
C ⁴	Rod connecting throttle-valve with timing-gear.	K ⁶	Lever-arm fixed to first and second sleeves.
C ⁵	Casing containing gear for commutator.	K ⁷	Spring-lock lever for K ⁵ .
D	Pressure oil receiver.	K ⁸	Spring-lock lever for K ⁶ .
D ¹	Sight-feed lubricator.	L	First exhaust-box.
E	Flywheel.	L ¹	Final exhaust-box.
E ¹	Free-wheel sprocket on crank-shaft.	L ²	Exhaust-pipes.
F	Shaft for starting-handle.	L ³	Ripe connection for pressure-valve.
F ¹	Clutch-pedal.	M	Brake-pedal.
F ²	Clutch-spring.	M ¹	Countershaft brake-drums.
G	Shaft connecting clutch with gear-box.	M ²	Hub brake.
G ¹	Gear-wheels on first-motion shaft.	N ¹	Transverse rock-shaft for same.
G ²	Intermediate "reverse" pinion.	N ²	Compensating gear for ditto.
H	Upper gear-box casting.		
H ¹	Inspection cover above bevel-gearing.		

THE SWIFT PETROL CARS.

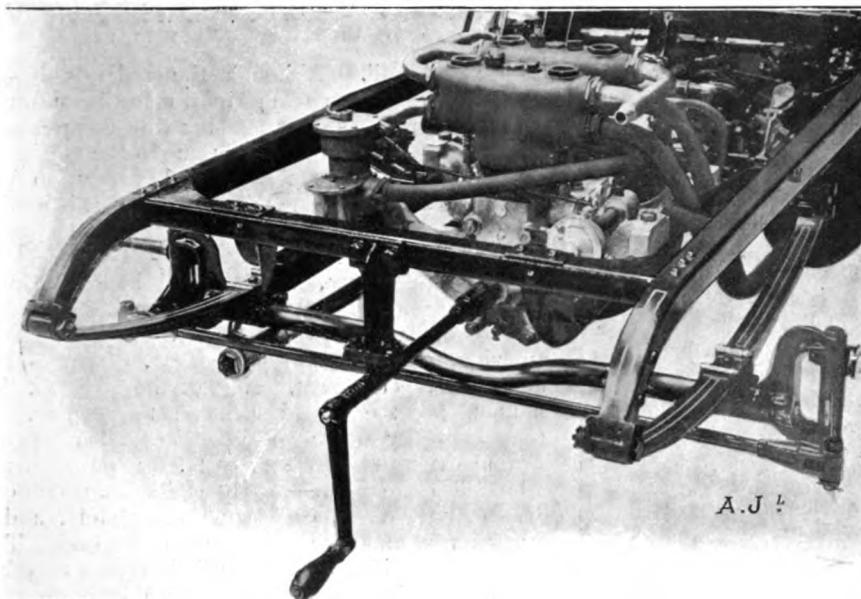
(Concluded from page 251.)

Fig. 2.—The front portion of the 7-h.p. Swift Chassis, showing the neat little Twin-Cylinder Engine, fixed in place.

The 7-h.p. engine, which is shown in place in the chassis in Fig. 2, is of a particularly neat and compact form, with the two cylinders formed by separate castings, the heads and valve-chambers of which are jacketed. The inlet and exhaust-valves are symmetrically arranged on the two sides—with inspection-plugs above them—but the cam-shaft passes transversely across the centre of the crank-chamber, and is driven by skew-gearing from between the two cranks. At each side of the engine, it carries one enclosed cam for operating the two valves on that side, each cam acting upon its valves through small pivoted-levers, which also lie inside the same casing. The commutator is driven by bevel-gear off the left-hand end of the cam-shaft, and lies in a convenient position in front. On this engine, there are three bearings for the crank-shaft, and on the 4-cylinder model, which has separate cam-shafts each side, there are five bearings.

An automatic carburettor, of the "Rover" type, is employed, and the engine is controlled by the two small hand-levers that act on the throttle, and "time" the ignition, and are fixed to the steering-pillar. The circulating-pump, which is driven by friction off the fly-wheel, is of a special type—designed by the Swift Company—in which the thrust on the revolving blade-plate is taken by a ball that prevents any heavy wear taking place between the blades and the casing. The radiator is of the finned-tube type, with a tank frame, and forms the front of the bonnet. The engine is lubricated from the dashboard by a hand-pump, which can alternatively be put in communication with the crank-chamber or with the gear-box.

The main-clutch, which is of the cone type, is self-contained, so that no end thrust is imposed on the crank-shaft when it is in engagement. The clutch-fork is provided with a ball-thrust, that comes into action when the clutch-cone is held "out." Between the clutch and the gear-box, a square coupling is introduced, and the change-speed-gear itself has larger shafts than

formerly. A view of the gear is given in Fig. 3, the upper half of the box having been removed. It will here be seen that three forward speeds and the "reverse" are obtained, in much the usual way, with a direct-through-drive on the top speed. The lay-shaft proper is held stationary, for it merely provides a bearing surface for the revolving sleeve that carries the three gear-wheels. This sleeve has several holes drilled through it, to allow the oil to get through to the shaft, and it will be noticed that the direct-through-shaft has ring-lubricated bearings. The intermediate spur-wheels, that give the "reverse," remain normally at rest, and are only slid into engagement when actually required for use, but the hollow lay-shaft at all times revolves when the car is running. The

gear is controlled by a single side lever, which can be moved backwards and forwards over a plain quadrant.

The three brakes that are fitted to this car are all interchangeable, and have metal-to-metal friction surfaces. The brake that is operated by the foot-pedal, has its drum fixed immediately behind the gear-box, so that the drum actually overhangs the bearing, and the other two brakes are, as usual, simultaneously operated by the hand-lever—alongside the gear-lever. Neither the hand, nor the foot, brake is inter-connected with the main-clutch.

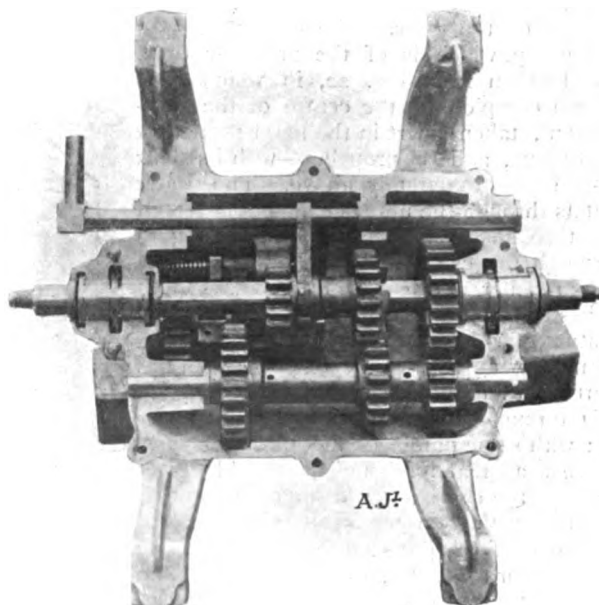


Fig. 3.—Interior view of the Swift Gear-Box; the upper portion has been taken off to show the arrangement of the Gear-Wheels.

THE 20-H.P. BROTHERHOOD PETROL CAR.—PART V.

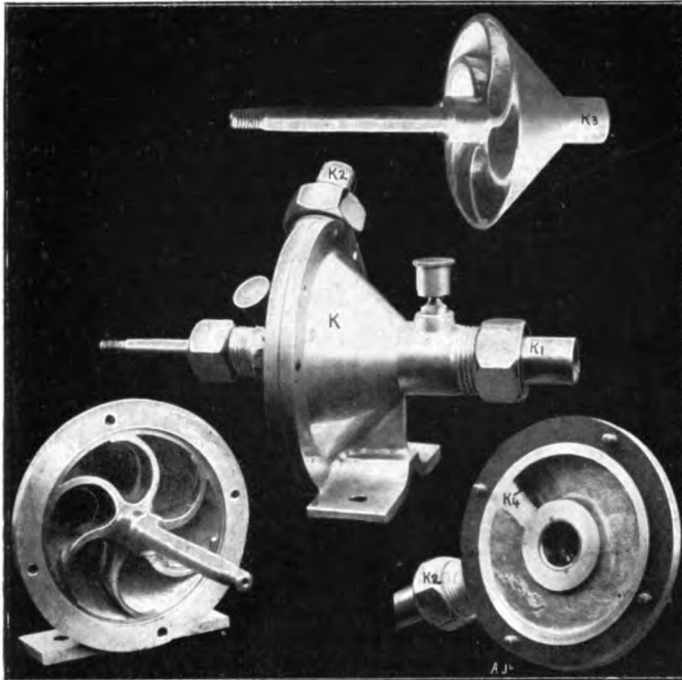


FIG. 22.—The Brotherhood Circulating-pump, shown complete and in parts.

The Cooling System.

THE position of the circulating pump, K, is well shown in Fig. 14, where it will be noticed that it is fixed on the left side of the engine, and is driven by a gear-wheel that meshes with the larger wheel on the exhaust cam-shaft. The pipe connections between it, the engine, and the radiator are all very direct, and, although large, do not interfere with the accessibility of any of the parts. The construction of the pump, which is of the propeller type, will be seen from Fig. 22, in which it is shown complete (in the centre of the illustration), taken apart in the lower portion of that figure, and the propeller—with its shaft—is shown separately above. The water enters through the union, K¹, and is forced out through the pipe-fitting, K², flowing in through the cylindrical end-bearing, K³, of the propeller, and being forced along so that it has to pass through port, K⁴. The special feature of the pump is that the propeller is formed with a smooth, external, conical, surface, which can bear up against the inside of the pump-casing, K, without cutting into it; with some pumps of the propeller type, there is a great tendency for the blades to damage the casing. In common with other pumps, acting on the same principle, and with centrifugal pumps also, there is a free passage for the water, even when the pump is at rest, and thus, on the Brotherhood car, the water would still circulate on the thermo-siphon system, even should the pump come

to a stand still. Although the radiator has a capacity of less than two gallons, it has been found to be of ample size for keeping the engine cool at all times, this being partly due to the efficiency secured by its construction, and partly to the effective draught which is created through it by the fan-blades in the flywheel and those in the clutch-cone.

Of its appearance, nothing need be said, since it was particularly well shown in the first illustration accompanying this article—the same remark applying, too, to the air-tight bonnet, of which the radiator forms the front. Neither the radiator, the bonnet, nor the shield beneath the engine, interfere in any way with the accessibility of the engine or of its accessory parts, for the bonnet—which is quite plain—has hinged sides, which can be easily let down, or detached completely, and a hinged top, of which the same may be said. The top and the sides are usually held rigidly together by two special clips, which give a kind of cam action that makes a tight joint between them, and prevents any appreciable quantity of air from entering except through the radiator. The sheathing beneath the engine is hinged down the middle, and the pin that acts as the bolt for the hinge can itself be detached from the aluminium bridge castings that pass across from side to side of the frame; the sheathing is, in fact, like many well-known types of bonnet, and can consequently be taken down much more conveniently than is the case on most cars.

Fig. 23, which includes a longitudinal and a transverse section, shows the construction of the radiator. It consists of three rows of finned-tubes, one behind the other,

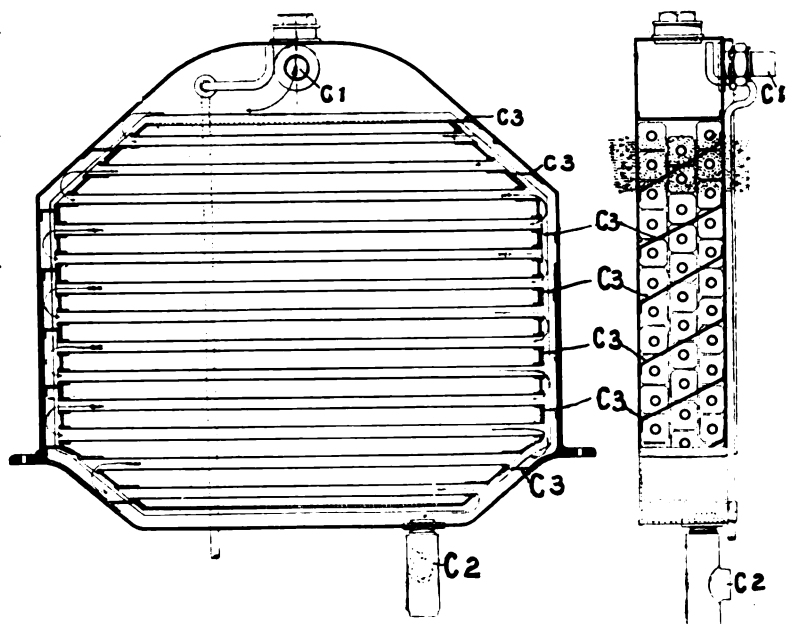


FIG. 23.—Longitudinal and Transverse Sections through the Brotherhood Radiator, showing the arrangement of the horizontal tubes, and of the Baffle-plates.

each row having a number of horizontal tubes that pass across from the header on the one side to the header on the other side. The tubes in each row are not arranged immediately behind one another, but are staggered as seen in the transverse-section, so that the air is thus compelled to pass over all their surfaces. The air approximately follows the lines denoted by the arrows in that drawing, with the result that the tubes in the two rear rows are rendered more effective than they otherwise would be.

The water enters the upper tank-portion of the radiator through the pipe, C^1 , and then finds its way down through each successive tube, in each row, as indicated by the arrows in the longitudinal section, until, ultimately, it emerges through the pipe, C^2 , from which it is led back to the pump. It will be noticed that baffle-plates, C^3 , are fitted into the sides of the radiator, between the tube-plates and the outside casing, and that it is these plates that cause the water to flow through the pipes in series. It will also be seen, in the transverse section, that the baffle-plates are arranged at an angle, instead of horizontally, so that should there be, at any time, insufficient water to fill the whole of the radiator, the water that does pass through it will tend to flow through the front row of tubes, in preference to the other rows, and will thus be cooled more rapidly than it otherwise would be.

The radiator is of simple construction, and although there is very little chance of a tube breaking, yet it is not a difficult matter to replace one, if necessary. In order to allow for the expansion that takes place, when the water becomes hot, the bolts that secure it to the frame pass through slotted holes, and thus prevent it from being damaged by the strains that would be imposed.

Any radiator of this kind is liable to expand fully a quarter of an inch in consequence of the variations of temperature to which it is subjected, and hence this provision is of great importance.

The Lubricator.

Although the moving parts in the crank-chamber are fed with oil in the usual way—on the splash principle—yet a special mechanical lubricator has been devised for feeding the oil in regular quantities to the two portions of the crank-chamber, and the lubricating system is thus rendered entirely automatic. Its design is—from many points of view—extremely ingenious, for it not only ensures a positive feed of oil to the engine, and causes that feed to vary as the engine-speed varies, but it also enables the driver to see immediately whether the pump is working properly or not. The lubricator has separate adjustments for each of the two feeds, and a strong point is that it is quite immaterial whether the oil is slightly thicker or thinner than usual, while another useful feature possessed by this apparatus is that the same pumps can be operated by hand—if from any cause a greater quantity of oil should at any time be needed.

The construction of the lubricator is shown by sectional drawings in Fig. 24, where it will be noticed that it is fixed to the dashboard, and is driven from the engine by a belt. The belt-pulley, L , is fixed to the spindle, L^1 , that carries a worm, L^2 , inside the oil-container, and this worm drives the worm-wheel, L^3 . The shaft of the worm-wheel has crank-pins, L^4 , at either end, and, on these crank-pins, are small rollers that engage with the pivoted lever-arms, L^5 . The lever-arms, L^5 , are forked at their extreme ends, so that they cause the pump plungers, L^6 , to move up and down with them, but they can only be raised by the crank-pins, and are, in turn, moved down again by the pump-plunger. The levers cause the plungers to make their suction strokes, and they raise them sufficiently far to allow the oil to flow into the pump-cylinders through the small holes, L^7 , after which the springs, L^8 , are relied upon to give the downward strokes, and to force the oil, past the ball-valves in the base of the pumps, into the feed-pipes, L^9 .

The worm-wheel, L^3 , only makes one rev. per min., when the engine is running at 1,000 revs. per min., and therefore the springs, L^8 , have plenty of time to act, before the plungers are again raised. At each stroke, about twenty drops of oil are forced down the feed-pipes, but the actual amount can be adjusted by the nuts at the top of the plungers, for these nuts limit the extent of the downward strokes by acting as stops for them. It will, of course, be realised that the quantity of oil which the engine receives from each pump is at all times, proportioned to its speed, because each pump acts once for every thousand turns of the crank-shaft.

By watching the projecting rods, L^6 , the driver can see whether the pumps are working properly or not, for, by noticing whether they descend at the proper rate he can detect any stoppages there may be, either in the holes, L^7 , leading into the pumps, or in the delivery pipes. Should the former fault arise, the plungers, L^6 , would descend very rapidly each time, whereas if the delivery pipes were blocked, the plungers would not descend at all. It will be noticed that a large funnel-mouth is arranged about the filling cap, and that the plug portion is so shaped that it prevents dust from collecting in the funnel. Forming part of the same apparatus, is a separate paraffin reservoir, which is provided with its own hand pump; it allows paraffin to be forced down to all four pistons.

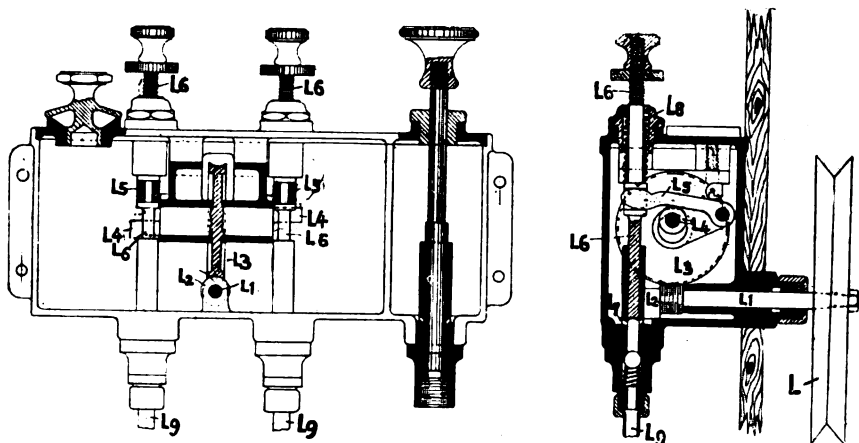


FIG. 24.—Longitudinal and Transverse Sections, showing the Construction of the Brotherhood Lubricator.

By the system adopted, it is always possible to introduce the required amount of oil into the crank-chambers, after they have been cleaned out at any time and before again starting the engine—about a pint in each being necessary for this purpose. Under ordinary working conditions, however, the engine requires a certain steady feed to make up for the oil that is lost, and it is this feed that is automatic. The very great importance of ensuring a precisely correct feed at all times, to avoid the nuisance

of over-lubrication *or* of insufficient lubrication, is so fully realised by all practical motorists, that the advantages of the "Brotherhood" system cannot but appeal forcibly to them. The system adopted practically affords an entirely automatic device that is incapable of varying, but is fitted, nevertheless—in just the same way as a watch—with a regulator, which enables this lubricator to be "tuned" to precisely suit each individual car.

(To be continued.)



THE 16-H.P. ALBION CAR.—PART III.

THE contact points of the low-tension igniters are both platinum-tipped, and Mr. Murray considers that this is desirable, even though the spark obtained from platinum-contacts is admittedly "thinner" than that which can be obtained from the same electric current when employing steel-contacts, as is the usual practice. On the other hand, however, Mr. Murray finds that they keep cleaner and thus require practically no attention. It is mainly on

of the exhaust stroke. The portion of the stroke during which this is possible is rendered clear in Fig. 8—in which the cycle of the leading cylinder has been superimposed on that of the other cylinder—where it will be noticed that *both* exhaust valves are simultaneously open for a short period. The pressure of the exhaust gases in the leading cylinder is, of course, inferior, during that period, to that of those which are just beginning to escape from the other exhaust valve, and the consequence is that the clearance space in the leading cylinder becomes charged with these latter gases, which, being above atmospheric pressure, seriously affect the volume of mixture drawn in on the suction stroke. On an indicator diagram, the effect is similar to that caused by premature closing of the exhaust valve, as will be seen by the sudden rise (X) at the end of the exhaust stroke in the right-hand diagrams of Fig. 9.

The diagrams shown in Fig. 9 were taken by Mr. Murray, from an Albion engine, with a McInnes-Dobbie indicator. Those on the right were taken from the leading cylinder, that above representing the compression diagram only, while the lower one shows that a small amount of work was being developed. In both cases Mr. Murray attributes the rise (X) at the end of the exhaust-stroke to the inrush of exhaust gases from the other cylinder, of which normal diagrams are shown to the left.

This point is the more interesting that the junction-pipe used was not a right-angle T-piece, but a Y-bend of very gradual slope, designed so that any inertia possessed by the exhaust gases should tend to draw out—rather than augment—those of the leading cylinder.

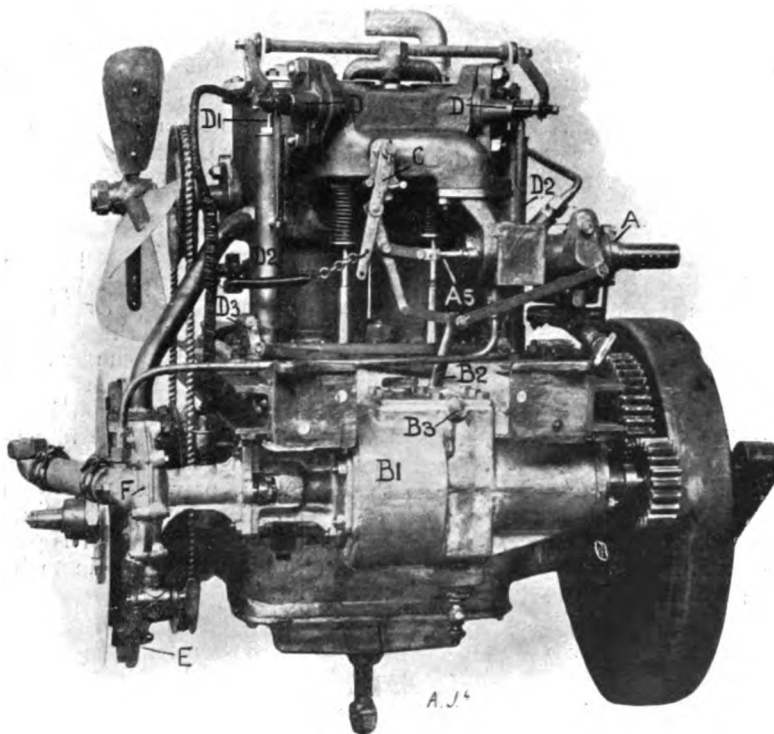


Fig. 3.—View of the Twin-Cylinder 16-h.p. Albion Engine, from the Left Side, showing the Governor Control on the Carburettor and Ignition.

account of the use of platinum-contacts that the magneto itself is made as large, although its position on the engine almost precludes it from being any less substantial in construction if the same simplicity is to be retained in its design.

It has already been mentioned that separate exhaust pipes are led from the engine to the silencer, the reason for this being that the previous practice of joining up the two exhausts by a T-piece was found very detrimental to the efficient action of the leading cylinder. Mr. Murray attributed this to the entry of exhaust gases—expelled from the other cylinder—during the latter part

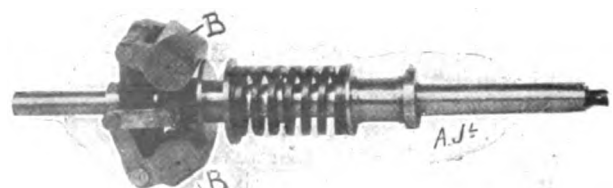


Fig. 4.—View of the Governor of the 16-h.p. Albion Engine, showing the Long Range Spring.

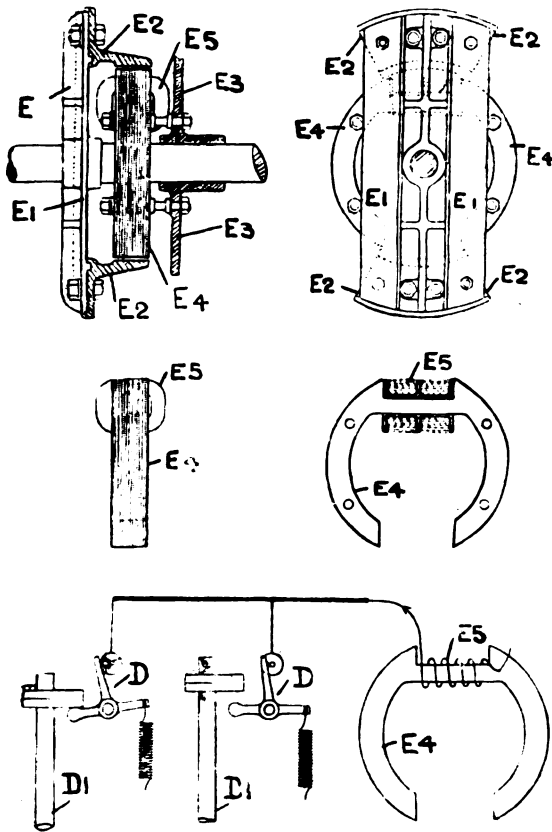


Fig. 7.—The Albion Low-Tension Magneto.—The views at the top of the illustration are Sectional and End views, respectively, of the complete apparatus. Beneath, the Armature with its Coil is shown separately in two positions. In the lower part of the illustration is a diagram of connections.

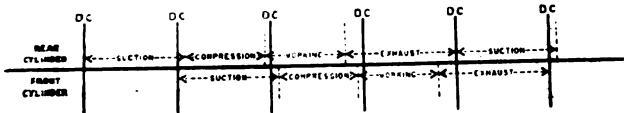


Fig. 8.—Diagram showing that both exhaust valves of a twin-cylinder Albion Engine are open at the same time for a short period during each complete cycle.

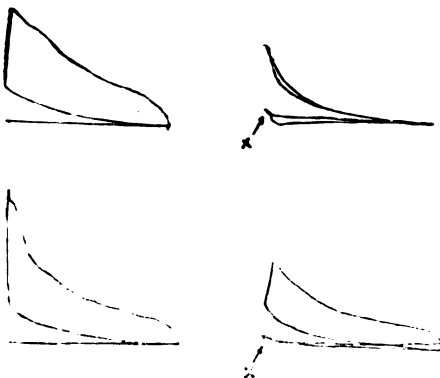


Fig. 9.—Indicator diagrams from an Albion Engine, showing the rise in pressure (X) at the end of the exhaust stroke of the leading cylinder, due to the entry of exhaust gases from the other cylinder.

The clutch is of the external cone type, and has metal-to-leather friction surfaces. A sectional elevation of the clutch is shown in Fig. 10, and illustrates the unusual arrangement of the clutch-spring, which has been adopted in order to eliminate end thrust, and, at the same time, to take up as little space as possible. Referring to Fig. 10, the outer clutch-member, T^1 , forms the flywheel, and is keyed to the crank-shaft, T^1 . The inner member, T^2 , is carried by a sleeve, T^3 , which rides on a projection of the crank-shaft, T^1 . This part of the crank-shaft, T^1 , is hollow, and accommodates the clutch-spring, T^6 . Passing down the centre of the spring, T^6 , is a bolt, T^4 , and it is against the flat head of this bolt that one end of the clutch-spring presses, the reaction of the spring being taken by a ferrule which screws into, and partly closes, the hollow end of the crank-shaft. The pressure of the clutch-spring is transmitted through the bolt, T^4 , to the nut, T^5 , on its outer end, and so causes the inner clutch-member, T^2 , to be forced into engagement with the outer member, T^1 . It will be noticed that no end thrusts are imposed on the shafts while the clutch is engaged, and that a ball-thrust bearing, T^7 , is employed to relieve the spring of any torque when the clutch is disengaged by means of the foot-pedal, T^{10} , the clutch-fork, T^8 , and the collar, T^9 . The sleeve, T^3 , is connected to the clutch-shaft by a universal joint not shown in Fig. 10, and slots are cut in it so that a "tommy-bar" can be inserted into the nut, T^5 , for adjusting the clutch-spring.

(To be continued.)

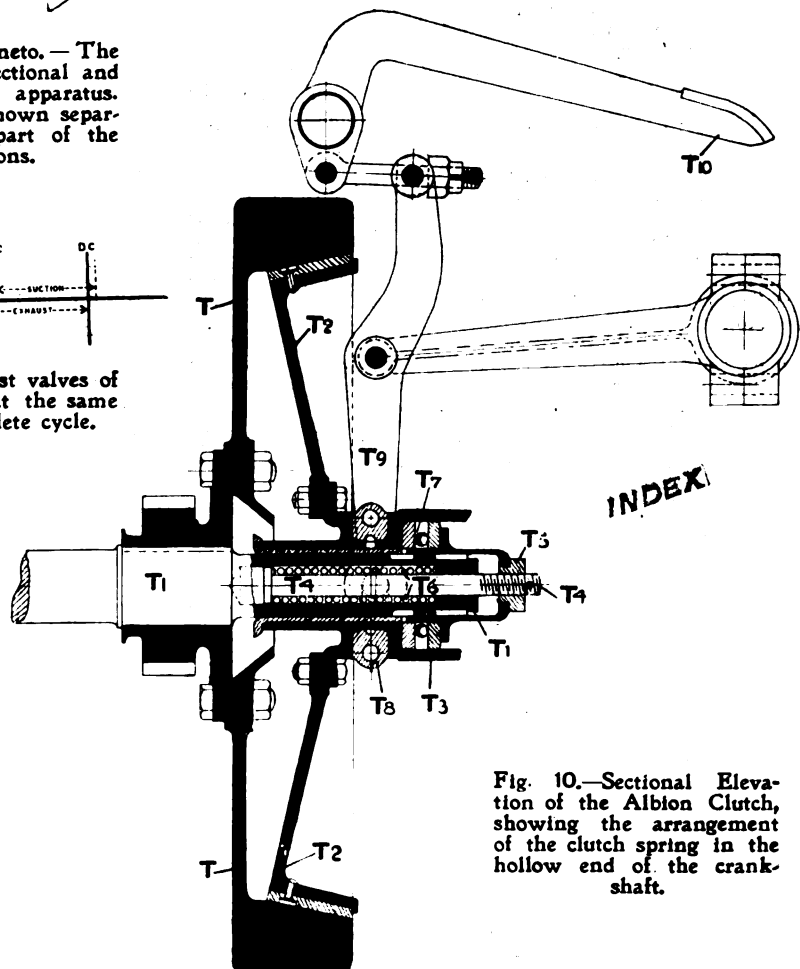


Fig. 10.—Sectional Elevation of the Albion Clutch, showing the arrangement of the clutch spring in the hollow end of the crank-shaft.

RACES, RECORDS, AND TRIALS.

DELHI-BOMBAY TRIALS.

WE have received, under date of February 28th, an important contribution from Mr. A. Huntley Walker to the much-vexed question as to the winner of this trial. By this it would now appear that—although the De Dietrich car was awarded the Gaekwar of Baroda Cup—by the judges' report, from which Mr. Walker sends us extracts, the actual *winner* of the Reliability Trial is the 12-h.p. Darracq car, which the judges consider did the best performance as regards reliability, the Lyon Cup also being awarded to this car.

The next place is given for the second best performance to the 6-h.p. Wolseley, which also obtained full marks for a non-stop run, and was awarded the *Times of India* Cup.

It would appear from Mr. Walker's communication that the judges have never considered the Gaekwar Cup as the principal cup of the trials, and they awarded this cup to the De Dietrich car, as they considered it was under ordinary circumstances the car best suited for the object for which that particular cup was given.

The following is the letter which Mr. Walker has sent us, from which we have omitted one or two paragraphs, which do not bear upon the questions of fact, with which he otherwise deals:—

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—As a competitor in the recent Delhi to Bombay motor trials, may I be permitted through your columns to correct the many misleading statements which have appeared in the Press concerning the results and the actual winner of these reliability trials.

I notice that the motor Press of this country are as much bewildered as the press of India was over the awarding of the Gaekwar Cup to the De Dietrich car, when this car had done so badly in the trials, and the ridicule which has been caused by this decision has inclined many people to regard these trials as a fiasco and to attach no importance to them.

Previous to leaving India, I saw Colonel Grantham, the senior judge; he particularly desired and authorised me to explain the judges' position in the most unfortunate dead-lock which has taken place between the committee of the Motor Union of Western India and the judges who acted in the trials, in regard to the publication of the official judges' report which Colonel Grantham sent to the secretary of the Motor Union on January 5th, with the request that it should be communicated to the Press immediately, which report the committee have most foolishly withheld from publication, on the absurd plea that they feared litigation from the principal claimant to the Gaekwar Cup.

The claimant in question has no thought of litigation, and only asks what in common fairness he is clearly entitled to, namely, that he should receive a public acknowledgment, in accordance with the judges' report, that having done the best performance as regards reliability, in consistency with the conditions under which his entry was made, he can claim that he won the reliability trials.

The judges desire to disclaim all responsibility for the original programme and conditions under which the European entries were received, and of which they were never informed. In awarding the cups, they were guided entirely by the rules and conditions placed in their hands at Delhi, which they were not aware had been altered from those under which the entries had been made; the responsibility for such alterations rests entirely with the committee of the Motor Union.

The following is the judges' report which was forwarded to the committee on January 5th, with the request that it should be published, and which has up till now been withheld:—

The Judges' Official Report and Award.

"1. The winner of the Reliability Trials is the 12-h.p. Darracq automobile, which did the best performance as regards reliability, having done an absolute non-stop and not having lost a single mark. This car was also awarded the Lyon Cup for having done the best performance for cars costing under £500 landed in India.

"2. That the car which made the second best performance in the Trials was the 6-h.p. Wolseley, which also had full marks and a

non-stop run. On deciding between the above two cars the judges based their award on the superior condition of the engine of the Darracq car at the completion of the trials. The judges award the *Times of India* Cup to the Wolseley car.

"3. That the Gaekwar Cup for the car most suited, in the opinion of the Judges 'for the furtherance of the use of motor cars in India,' was awarded to the De Dietrich car, which, although the Judges have taken into account the 58 marks lost by the same during the Trials, they consider under 'ordinary circumstances to be best suited for the object for which this particular cup was given.'"

The report goes on to state the particulars of the other awards, with which I do not think much dissatisfaction has been caused.

There is no doubt that the judges have never considered the Gaekwar Cup as the principal cup of the trials, and have not seriously taken either the number of marks lost or the actual performance of the De Dietrich car in the trials into account in awarding this cup. It is unfortunate that this particular cup should have been placed at the head of the cups on the programme, as it evidently was not intended to award it to the car which actually won the trials.

Personally, I have never known any reliability trials or races where the general arrangements for the comfort of everyone, the policing the roads, and the condition of the roads, have been so admirably carried out, and when so much praise is due and given unanimously, why suffer it to be forgotten in a chorus of abuse?

This letter is in no way the complaint of a dissatisfied competitor, for personally I make no claim to any cup, but it is an attempt to place the judges' position in regard to the late trials as fairly as possible, and if they have made a serious error in their award of the Gaekwar Cup, as seems so universally agreed, they have endeavoured to explain fully their reasons and to rectify as far as possible in their official report any confusion of this cup with the winner of the trials, therefore the responsibility for the confusion which has arisen since January 5th falls on the committee of the Motor Union, who have chosen to withhold from publication the judges' report sent to them on that date with a desire for the same to be communicated to the Press.

Yours truly,

A. HUNTLEY WALKER.



THE GATACRE HILL CLIMB—LEGAL PROCEEDINGS.

IN connection with this competition, which took place last September, Mr. Dumbell, Managing Director of the Turner Motor Manufacturing Company, brought an action against the Wolverhampton and District Automobile Club, before the Wolverhampton County Court, claiming certain prizes or their value from the club. The case was heard on Friday of last week. The principal points of the case, which was ultimately decided in Mr. Dumbell's favour, are set forth in a letter which he has sent us, and which runs as follows:—

You will, no doubt, remember the unfortunate dispute that I had last autumn with the Committee of the Wolverhampton and District Automobile Club in the matter of the Gatacre Hill Climb.

You will perhaps remember that my 10-h.p. Turner-Miesse steam car made the fastest time in the Open Competition, defeating all the petrol cars, which included cars up to 20- and 24-h.p.

Notwithstanding this fact, I was not awarded the prizes.

Failing to get a satisfactory explanation as to the results from the committee—who, through the Hon. Secretary declined to give me any information as to how the results were arrived at unless I would agree to make no use whatever of any information I obtained—with the very greatest reluctance I felt compelled to contest the matter in the Law Courts in the interest of steam cars generally and the Turner-Miesse (in which I am especially interested) in particular.

Before resorting to legal proceedings, I used (both directly and through my solicitors) every effort to obtain an explanation without the unpleasantness to all parties of litigation. But the committee thought fit to take a high hand, and refused to give me the desired information and explanation unless I would make no use or publication of any information I obtained.

The case was heard to-day in the Wolverhampton County Court before Judge Howland Roberts and a jury. From the correspondence disclosed in evidence it was perfectly clear that Mr. F.

Straight, the official handicapper, first of all made an award allotting the first prize in each competition to my Turner-Miesse car.

After the competition took place, and the actual times taken by the competing cars were known, the hon. secretary wrote a letter to Mr. Straight (the handicapper), enclosing the particulars of h.p., weight, and times taken, to enable Mr. Straight to make the awards, and in his letter the hon. secretary went on to say (*inter alia*):—

"As no intimation has been given to the competitors, as to the formula upon which the handicap will be made, same is left absolutely to you. The opinion, however, has been expressed that, so far as steam cars are concerned, they should be placed on a different basis to petrol cars."

Shortly afterwards Mr. Straight sent in his awards, which, it was admitted in evidence, placed my 10-h.p. Turner-Miesse as winner in both competitions. In his letter disclosing the awards Mr. Straight said:—

"I beg to enclose herewith the result of your hill-climb, worked out on the basis adopted by the Midland A.C., and which is the most satisfactory of any that I have tried.

Time x H. P.
The formula is:— $\frac{\text{Total weight.}}{\text{Total weight.}}$

"As regards steam vehicles, nothing can be done with regard to these so long as they are accepted in the same class as petrol vehicles.

"If this is not satisfactory, kindly let me know, although I do not see what else can be done."

This award the hon. secretary returned to Mr. Straight with the following letter:—

"I am obliged by receipt of your letter and enclosures, which are returned herein. In the club handicap you will notice that you have not given either 5th or 16th. Kindly make necessary alterations and return in due course.

"As to steam cars, the committee were under the impression that, having regard to the increased horse-power they develop over petrol cars on hills, they should have been penalised by the handicapper to the extent of 10 to 20-h.p., otherwise special provision would have been made in the rules. The matter is, however, in your hands as handicapper, and if you are of opinion that no injustice can be done to steam cars by acting in accordance with the committee's anticipation, I shall feel obliged if you will revise your handicap, any increased fee for the additional trouble involved being, of course, paid by my committee, who are desirous that the handicap should be as equitable as possible."

Mr. Straight did, as desired, revise his original award, with the result that my car, instead of being placed first in each competition, as it was in his original award, was placed sixth in the one competition and tenth in the other.

After an exhaustive hearing, the jury decided that the competition had not been fairly and properly conducted, and returned a verdict in my favour, awarding me £7 14s., the value of the first prize in each event, the challenge cups (on the undertaking of the defendants) to be handed over to me, to be held in accordance with the conditions which governed the competition.

In view of the importance of the case, the Judge awarded me costs on the higher scale.

Scottish Reliability Trial.—The preliminary rules and conditions are published of this reliability trial for touring cars, which the Scottish Automobile Club (Western Section) have determined to organise for this year. The trial will occupy four days, the dates fixed being May 10th, 11th, 12th and 13th next. This trial, as previously announced, will take the place of the regular reliability run from Glasgow to London, which for the past three years has been carried out by the club. The new form of the annual test will be of a much more severe character, and the organisers think that the route selected will be unequalled in variety and hill-climbing tests by any reliability trial yet held anywhere, and should therefore receive widespread public notice and ensure valuable results. The trial is one purely of reliability, speed in excess of the maximum allowed counting rather against than in favour of the competing cars.

There will be four classes, viz.: Class A, 1-cylinder

petrol vehicles; B, 2-cylinder vehicles; C, with 3 or more cylinders; D, steam cars. Class D may be subdivided at a later stage if the committee deem it desirable. No cars of greater power than 35-h.p. are eligible for entry. The horse power will be determined in accordance with the following formula:—

$\frac{\text{Cylinder diameter in inches}^2 \times \text{number of cylinders.}}{3}$

Under the above formula, cars showing more than 12-h.p. must have a seating capacity of not less than three. In each class only one car of any specific make, type, and horse-power can be entered. To constitute different horse-power there must be at least 15 per cent. difference in cylinder capacity. Preference in entries will be given to (1) a maker, or (2) the nominee of a maker.

The trial will practically form a non-stop run, as all stops except tyre troubles will entail loss of marks, and no repairs or adjustments are permitted during the official stops. Entry fees are 10 guineas for 2-seated vehicles, and 12 guineas per car for all others. All entries should be sent to Mr. R. J. Smith, the hon. secretary, 59, St. Vincent Street, Glasgow, not later than April 5th. Entries for 21 days subsequent to that date may be received at double entrance fees. Observers will be appointed, and their expenses paid by the club. Maximum marks will be allotted, and one mark for every minute of involuntary stops, except for tyre troubles, will be deducted. In addition, one mark for every minute in excess of either the maximum or the minimum time officially allowed will also be deducted. Deliberate intention to exceed the maximum speed allowed will lead to disqualification. In regard to tyre troubles if, during the whole trial, more than four hours in the aggregate are occupied in stops for tyre repairs or troubles, the excess will be reckoned involuntary stops, and count against the car.

Hill Climbing Tests will be made, and the times recorded on three steep hills during the second, third, and fourth day runs. Each car must carry its full complement of adult passengers, and must not carry passengers in excess of its seating capacity. All cars must be fitted with recognised touring bodies, completely finished with the exception of paint. Fuel and water tanks must be of the ordinary size and capacity. Entrants will be bound to sell to the public motor cars and chassis similar to those competing at the price entered for a period of three months after the date of the Trial. A Non-Stop Gold Medal will be awarded in each class in addition to any special awards which the club may consider are warranted. In addition, a Silver Cup to be called the Glasgow Cup, has been presented by a private member to be awarded to the vehicle (excluding steam cars), which shows the lowest petrol consumption per ton mile for the whole trial. In the event of a tie between vehicles in any class for the Non-Stop Gold Medals, the award will be made to the car making the best performance on the basis of the following formula:

$\frac{\text{Laden weight of car in lbs.}}{\text{Aggregate of times taken in all hill climbs in minutes} \times \text{consumption during the whole Trial in gallons.}} \times 1000.$

The rules further contain provision for replenishing fuel, oil, cleaning, and repairs, for which certain times are allowed. Provision is also made for the testing of the brakes, by the Committee of any competing vehicle at



CANNES AUTOMOBILE WEEK.—As part of the contests in the Tourist Vehicle Reliability Trial, the results of which were published by us last week, the cars were timed and tested over special hills. The most severe was the one shown in our photograph in which the gradients were 1 in 5 and 1 in 6. Chevalier Florio's 60-h.p. Mercedes Car secured in this contest the Cannes Cup. As will be seen the cars had to start standing from the foot of this hill.

any time during the Trial. The itinerary and distances for each day's run are as follows:—

First Day.—Glasgow to Edinburgh 44½ miles, Stirling 35½, Perth 34½, and Dundee 21½. Total, 135½.

Second Day.—Dundee to Blairgowrie 19 miles, Glenshee (hill climb) and Braemar 34½, and Aberdeen 58½. Total, 111½.

Third Day.—Aberdeen to Alford 25½, Cockbridge and Corgarff (hill climb) 27½, Grantown 24, Kingussie 27, Struan 33½, and Aberfeldy 24½. Total, 162½.

Fourth Day.—Aberfeldy (hill climb) to Crieff 23½, Lochearnhead 20½, Dalmally 32½, Inveraray 15½, Arrochar 22½, and Glasgow 36½. Total, 151½. Grand total, 560½.

Hill-Climbing Tests.

1. Spittal of Glenshee—approximate length 1¾ miles, ditto rise 750 ft.
2. Cockbridge—approximate length 2 miles, ditto rise 775 ft.
3. Aberfeldy—approximate length 3½ miles, ditto rise 975 ft.

Tourist Trophy.—Active steps are now being taken to promote wider interest in this important contest being organised by the A.C.G.B.I. to take place in September next in the Isle of Man. A special commission has been appointed to deal with the whole event, and already the entries are beginning to mount up, about twenty-two cars having up to the present been entered to take part.

Florio Cup.—It is officially announced that the first prize of 40,000 francs offered by M. Florio for this Italian race, which takes place on the Brescia Circuit, is to be awarded to the actual proprietor of the winning vehicle, and not necessarily to the maker of the winning car.

Gordon-Bennett Race and the Grand Prix.—As regards these races affairs are in a rather nebulous position. Among the proposals put forward is that the Grand Prix should be run first, and the three first French cars in it selected officially on behalf of the French Club for the Gordon-Bennett. In this way the Grand Prix would be utilised as the French Eliminating Race for the latter event. This arrangement would have the advantage of getting rid of the trouble and expense involved in a separate eliminating race, but would seem to conflict with the decision recently arrived at by the Gordon-Bennett International Commission. However, the views of the manufacturers are before the A.C. de France, and it is hoped that some final and satisfactory arrangement will be arrived at.

Versailles Reliability Trial of the A.C. Seine-et-Oise.—These trials, of which we gave a few opening particulars last week, have been continued up to and including Sunday last, that day being the seventh and last day of the runs. During the fourteen stages run off in these seven days the entered cars covered a total distance of about 1,400 kilometres. Seventeen actually started, and three dropped out on the first day, whilst on the last day twelve started and finished, although probably a number of these will not be officially classed. The majority of the time the weather has been extremely unfavourable, rain, hail, and snow prevailing. On the fifth day, when Chartres was the furthest point reached, a test for starting was made prior to the vehicles being sent off on their day's run. The final run on Sunday last was to

Fontainebleau, a distance of 176 kilometres. The cars left in for this stage and their drivers were:—No. 2, 14-h.p. Chenard-Walcker (Laikault); No. 3, 18-h.p. Chenard-Walcker (Olivier); No. 6, 11-h.p. Gardner-Serpollet (Armand); No. 9, 12-h.p. Decauville (Ullmann); No. 10, 6-h.p. De Dion (Pellegrin); No. 11, 6-h.p. De Dion (Meurein); No. 12, 6-h.p. De Dion (Montariol); No. 13, 12-h.p. De Dion (de Lafreté); No. 14, 10-h.p. De Dion (Cormier); No. 15, 14-h.p. Roy (Roy); No. 18, 12-h.p. Clement-Bayard (Hamon); No. 21, 6-h.p. Bailleau (Bailleau).

The judges immediately after the finish of the last day's run brought all the figures up to date, and announced the same evening the most successful competitors in the general classing for endurance. Under these, Cormier, driving a 10-h.p. 2-cylinder De Dion-Bouton car, headed the list, gaining the prize offered by the Municipality of Versailles; a 6-h.p. 1-cylinder De Dion-Bouton car, driven by Pellegrin, was placed second; Ullman, on a 12-h.p. Decauville, being third; another 6-h.p. 1-cylinder De Dion-Bouton being placed fourth; and Olivier, on an 18-h.p. Chenard-Walcker, securing fifth place. The classing by categories since announced is as follows:—

CATEGORY 1.—5,000 francs and under:—

- (1). 6-h.p. De Dion (No. 10); (2). 6-h.p. De Dion (No. 12); (3). 6-h.p. De Dion (No. 11).

CATEGORY 2.—5,001 to 8,000 francs:—

- (1). 14-h.p. Chenard-Walcker (No. 2); (2). 12-h.p. Clement-Bayard (No. 18).

CATEGORY 3.—8,001 to 12,000 francs:—

- (1). 10-h.p. De Dion (No. 14); (2). 12-h.p. Decauville (No. 9); (3). 18-h.p. Chenard-Walcker (No. 3); (4). 11-h.p. Gardner-Serpollet (No. 6); (5). 12-h.p. De Dion (No. 13).

CATEGORY 4.—Over 12,000 francs:—

- (1). 14-h.p. Roy (No. 15).

Austrian A.C.—A tentative programme for the 1905 season is announced by the Austrian club. The Vienna Exhibition, as already announced, is fixed for May, the annual Exelberg Hill Climb is to be abandoned, and another race inaugurated near Vienna in its place. A tourist trial is to take place over a distance of 700–800 kiloms., in which the speed for voiturettes will be limited to 25 k.p.h., and for big cars to 30 k.p.h. The trial will extend over three or four days. As in previous years, the season will be brought to a close by the Semmering Hill Climb in September.

Competition for Silencers.—The A.C. de France Competition for Silencers, it is announced, takes place on the 1st April next. In the rules just issued, it is stated that each system should be represented by two sizes of silencer—one for a single-cylinder motor, and the other for a 4-cylinder engine. The engines on which the trials will be carried out have the following dimensions:—Single-cylinder engine, bore 140 mm., stroke 160 mm., speed 800 revs. per min., 8–9-h.p. Four-cylinder engine, bore 105 mm., stroke 105 mm., speed 1,400 revs. per min., 18–24-h.p.

All devices entered must be accompanied by sectional line drawings showing the interior construction. The judges, when making their awards, will take into consideration the silencing effect, back pressure induced, size, weight, and simplicity of the apparatus.

SEVERAL weeks ago we mentioned that it had been determined not to run the speed events over the mile and kilometre at Nice this year. This information has now been confirmed, the reason given being that the



HAVANNAH (CUBA) AUTOMOBILE MEETING.—Last week we gave particulars of some of the leading times made at this Cuban Meeting, including the 100 Miles Road Race, which was won by a native driver named Ernesto Carricaburu. He drove No. 5, a 60-h.p. Mercedes Car, and in our photograph above he is seen passing the winning post at the Grand Stand, from which point President Palma and his family witnessed the contests. The win was an extremely popular one, and the excitement at the conclusion is well seen in the attitude of the crowd cheering Carricaburu. The judge's box is the elevated structure in the centre of the Grand Stand on the left. The winner's time was 1 hr. 50 mins. 53½ secs.

A.C. of Nice has not found the replies to their invitation to the owners of all the big racing cars sufficiently encouraging for them to make the necessary arrangements for carrying out these speed tests. The suppression of these items in the programme will probably militate very greatly against the usual huge success which attends the Nice Automobile Week each year.

ALTHOUGH practically the whole of the money has been secured for creating a magnificent motodrome in France round the Chalons Camp, attention to which we drew several months ago, yet, from the latest news to hand, a doubt as to its completion is now looming in the near future. Chevalier de Knyff, the President of the Sporting Commission of the A.C. de France, whilst fully appreciating the possibilities of this 35-kilom. circuit, is doubtful as to being able to support the scheme, as the club think racing, to be effectual, must take place on ordinary "give-and-take" roads rather than be run over a prepared circular circuit of the nature proposed.

A CONTEST to ascend Pike's Peak Mountain next August is in process of organisation in America, and most of the crack racing men are expected to enter for this 9-mile ascent. The arrangements will probably be in the hands of the Denver Overland Racing Association, and, in addition to the actual climb up Pike's Peak, a day will be devoted to automobile races at Overland

Park, Denver, and a road race will be held from Colorado Spring to Denver, a run of 52 miles.

Quarterly 100 Mile Trials.—For the A.C.G.B.I. Quarterly 100 Miles Non-stop Trial, on February 17th last, only one car was entered, viz., a 16-20-h.p. 4-cylinder Hurtu car, entered by Messrs. E. and H. Hora, Ltd., 36-38, Peckham Road, S.E. The route was the usual one, from the motor house to just beyond the 49th milestone from London on the Oxford Road and back. The roads were good but greasy in London. The weather was fine and the wind on the outward journey strong against the car. The Hurtu car entered was gear driven, with transmission by Cardan shaft and live axle. Weight without passengers, 1 ton; with 4 passengers, 1 ton 6 cwt. Fuel used, 6 gals. 3 pts. 6 oz.; water, 22 oz. Average cost of fuel per mile at 1s. 3d. per gallon = '961d. Speed on outward journey, 16'39 m.p.h.; return, 15'33 m.p.h.

Hill-climbing speeds—

(a) The steep portion of Dashwood Hill. Time to danger board, 5 mins. 35 secs. = 7'205 miles per hour.

(b) One mile, including Dashwood Hill. Time for the mile, 6 mins. 55 secs. = 8'67 miles per hour.

(c) Ashton Hill—Took four passengers all the way up in 6 mins. 38 secs. = 14'7 miles per hour.

Remarks—Mr. J. L. Spong, who kindly acted as hon. observer, reports:—The engine was not pulling at all consistently throughout the trial. Stops, five, namely—

2 mins. for examination, as the engine was not pulling. The engine not stopped.

5½ mins. Engine stopped. Spring on air valve on carburettor tightened.

6 mins. Engine stopped. Spring on air valve on carburettor tightened.

27 mins. New spring on air valve on carburettor. Jet found to be choked.

1 min. Declutched to accelerate engine. Car stopped.

INTERNATIONAL CUP RACE FOR AUTO-CYCLES.

A VERY interesting function was held last week at the Automobile Club, when a complimentary dinner was given by the chairman of the Auto-Cycle Club, Mr. Robert Todd, to the competitors, and representatives of the firms who built the competing machines, in last year's international cup race for auto-cycles, held at Dourdan. The competitors present were Messrs. T. Silver, W. Hodgkinson, and H. J. Harding (reserve). Mr. H. Rignold, the other competitor, was unfortunately unable to be present owing to illness. Messrs. J. A. Prestwich and Wilbur Gunn represented the builders of the machines, Mr. Priest, of the Quadrant Company, also being unable to attend on account of illness. Mr. Todd was supported by such prominent motorists as Colonel H. C. L. Holden (president of the A.C.C.), the Hon. C. S. Rolls, Messrs. S. F. Edge, Chas. Jarrott, etc. The Chairman, having proposed the usual loyal toasts, called upon Mr. G. F. Sharp to propose the toast of the evening—"England's Representatives in the 1904 International Cup Race." He (Mr. Sharp) regretted the absence of Messrs. Rignold and Priest, and also that of Mr. O'Gorman, who, owing to a prior engagement, was unfortunately unable to be present that evening. Last year the club only received very short notice of the competition, and makers only had a very short time in which to make their plans and build their machines, and he was very agreeably surprised when he heard that three firms had decided to enter for this important event. They had many difficulties to contend with, the rules were very stringent, all machines had to be fitted with pedalling gear, the greatest possible horse power had to be made use of, and the machine in its complete state had to be within the limit of 110 lbs., whilst perhaps the greatest difficulty which confronted the English makers was that of properly testing their machines. Referring to the very able report which the club's representative on the International Commission, Mr. O'Gorman, had given them of everything which occurred incidental to the race, Mr. Sharp pointed out that what our French opponents most feared was the reliability of the English machines. In this they were not disappointed, as our troubles arose through tyres alone, which, unfortunately, had not been made to resist tin-tacks. Our representatives suffered from lack of outside organised assistance, and it was in this respect that our opponents scored, as they had spares and assistance all round the circuit. Such breaches of the rules as occurred would not be allowed this year, and the club would endeavour to have representatives at each of the controls to look after our men. The selection trials would probably be held in the Isle of Man, and he hoped that the fund which had been started by Mr. Edge to pay the expenses of the selected team would continue to grow. It now amounted to nearly £200, and a cheque for fifty

guineas had only that morning been received from the Stanley Show Committee. He then asked the chairman to present to each of the competitors the souvenirs given by the Auto-Cycle Club to commemorate the first international cup race.

Mr. Todd then presented a gold signet ring, inscribed "Represented England in the International Cup Race, 1904," together with the owner's initials, to Messrs. Silver and Hodgkinson, and asked Mr. Gunn to take Mr. Rignold's ring on his behalf.

Mr. Gunn, in replying to this toast, made a very practical speech, in the course of which he urged the English competitors not to under-estimate their opponents, and gave it as his opinion that the engine should be of as large a power as it was possible, consistent with safety, to put on a machine which, when completed, did not weigh more than 110 lbs. He also thought the manufacturers should send over their representatives in ample time, so that they could be thoroughly accustomed to the actual course on which they were to compete, and to travelling along the roads at a high rate of speed, for which they had no facilities in this country.

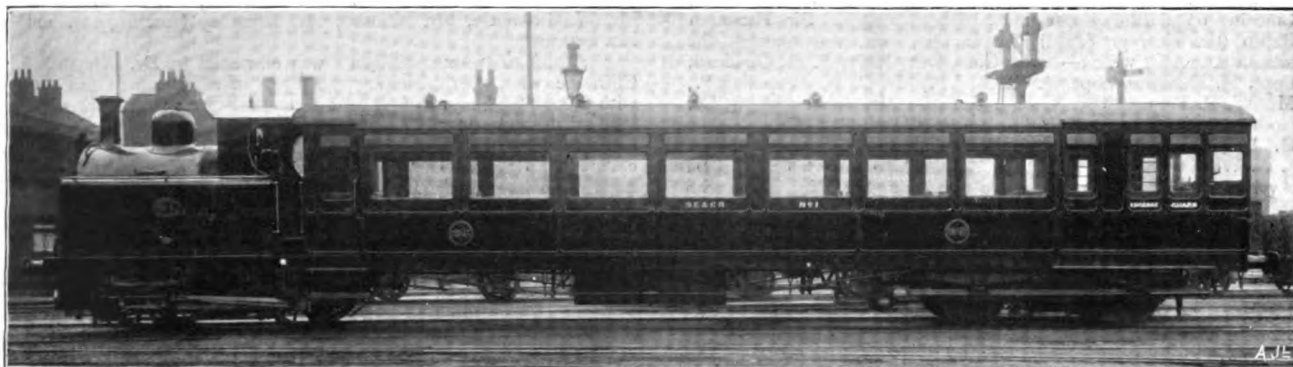
Mr. A. J. Wilson proposed the toast of "The Motor Industry," and referred to the fact that France had produced the ordinary cycle, which England had adopted, and afterwards surpassed them owing to our manufacturing much better machines, and he hoped it would be the same in the motor industry.

In response to this toast, Mr. S. F. Edge pointed out how greatly the motor car industry was indebted to the motor bicycle, which he looked upon as absolutely the best school in which to become acquainted with the internal combustion engine. Every man who possesses one hopes some day to buy a car, and he was of opinion that motor car manufacturers should look upon it as their solemn duty to support the motor cycle industry for that, if for no other reason.

He did not think that sufficient publicity had been given to the International Cup Race, and he suggested that the Club journal should devote a column a week to the subject, setting out in an attractive manner details for the public, particulars of the men entered, their machines, and information regarding the course. Referring to the latter, he considered that some of our representatives should have been over this already. He desired to emphasise the point that motor car manufacturers did not realise how much the motor cycle had done and would do for them.

Mr. Chas. Jarrott agreed with all that Mr. Edge had said. He mentioned some of his early experiences of motor cycling, and wished he was going to enter a machine for the Cup, as he considered the motor cycling events in which he had competed some of the most sporting of his racing career.

THE S.E. AND C. RAILWAY COMPANY'S STEAM MOTOR COACH.



ONE of the latest steam motor coaches that has been built is that shown in our illustration, which commenced running on the South-Eastern and Chatham Railway Company's Sheppey line recently. Its total length over all is a fraction short of 65 ft., and its total weight is about 38 tons unloaded—of which about $24\frac{1}{2}$ tons are carried by the engine bogie at one end, and the remainder by the carriage bogie at the other. Both 4-wheeled bogies have an 8 ft. wheel base—that beneath the engine having 3 ft. 7 ins. coupled wheels, and that at the other end of the coach having 3 ft. 6 ins. wheels. The engine has its cylinders placed outside the frame, and both cylinders—which have the "Walschaerts" type of valve-gear—have a bore of 10 ins. and a stroke of 15 ins. The boiler is of the locomotive type, with a "Belpaire" fire-box, and the heating surfaces of the tubes and of the fire-box are 337 and $44\frac{1}{2}$ sq. ft., respectively. The grate area is 8.8 sq. ft., and the working pressure 160 lbs. per sq. in. The water tanks have a capacity of 400 gallons, and are placed at the sides between the bogie frames, while the coal bunkers—which carry about

15 cwt.—are situated at the ends of the side tanks. The engine can be detached from the carriage and run separately.

The carriage body is divided into three compartments, which are, respectively, for non-smokers, for smokers, and for the guard (with luggage), and the passengers compartments are finished in teak. The seats are arranged back to back, with a central gangway, the total accommodation being for 56 persons.

This coach can be driven from either end, is provided with hand-brakes, in addition to the vacuum-brake, and is lighted electrically. It is capable of taking an additional trailer, weighing 16 tons, at a speed of over 35 miles per hour on the level, which represents an average of about 30 miles per hour in practice. It was built to the designs of Mr. H. S. Wainwright, M.I.C.E.—Chief Mechanical Engineer of the line—by Messrs. Kitsons, of Leeds, and by the Metropolitan Waggon Company, of Birmingham. Smooth running has been ensured by the employment of rubber to a very great extent, in order to prevent vibration.



The Motor Industry and Exhibitions.—The following is an official statement issued by the Society of Motor Manufacturers and Traders in regard to the policy of the trade as to shows:—

The Society, having achieved a great success in the recent Motor Exhibition at Olympia, wishes to define its policy, so that both the trade and the public may understand its attitude towards the proposals made in certain quarters to dissociate the motor-boat section and hold a separate exhibition for motor-boats, and possibly for heavy motor vehicles.

The Society has decided to hold its next exhibition at Olympia in the late autumn of the present year. This decision is taken in the interests of the British manufacturers, who will thereby be enabled to show their cars at the best season of the year, and before the trade has been monopolised by earlier shows abroad.

At the same time, a show in the autumn will benefit the agents of foreign makers. These agents constitute a considerable portion of the society, and they will be able to do their business here instead of having it done behind their backs abroad.

With regard to commercial vehicles, this being chiefly a British trade, should in particular benefit by the date fixed for the show; and as some firms make light, as well as heavy, cars, and as the class of purchaser of pleasure cars is largely the man having business connections with, and therefore interest in, the commercial vehicle, it is advisable to show them together in the same Exhibition.

As regards motor-boats, here, again, the most prominent builders are also car makers. It is, therefore, convenient to show them together; and as the purchasers are of the same class as purchase

cars, it is most important to show them at the same time. For these reasons the Society holds that it is to the advantage of all these classes as well as of the makers of accessories that they should all exhibit at the one show—that show to be held about next November.

The question remains as to the convenience afforded all these sections for exhibiting at Olympia. The weeding-out process and the amalgamating tendency in the motor trade is likely to restrict rather than increase in the future the number of firms whose exhibits will be of real value to the agent, and of interest to the public. At the same time, the proposed alterations at Olympia will give increased and improved space, so that should the immediate future show an increase in the demand it can easily be met.

Doubtless as the novelty of these Exhibitions wears off, the public will become more exacting in their demand for seeing a great collective exhibit under the most comfortable and pleasant conditions, and it has already been shown that this can be met at Olympia. The electrification of the Underground, and new services of motor 'buses will, by next November, improve the already capital facilities of reaching Olympia, where the Society have, at great expense, laid a fine groundwork, to which, having the means and the time, it can put the requisite finishing touches.

Therefore, in November next the public will be treated to an extremely comprehensive exhibition, even more interesting than that recently held, and with whatever causes of complaint there may have been, removed.

The fact that the Society is receiving an immense increase of membership, from leading firms in all branches of the motor industry, proves that the policy of concentration is meeting with approval on all sides.

CLUBS AND ASSOCIATIONS.

Lincolnshire A.C.—The annual meeting of this successful organisation was held at headquarters, the Saracen's Head Hotel, Lincoln, on Saturday afternoon, February 25th. Sir Hickman Bacon (the club president) was in the chair, and amongst the members present were :—Major Cole, J.P., Major F. H. Goddard, Capt. H. Newsum, Capt. R. Gleed, J.P., Mr. C. W. Pennell, J.P., Mr. W. R. Pennell, Mr. George Godson, Mr. Cyril Nelson, Dr. Godfrey Lowe, Mr. C. H. Gilbert, Dr. Gilpin, Mr. Connell, Mr. G. H. Hazlehurst, Dr. de Beauvais, Dr. E. H. Cragg, and Mr. J. G. Wilkinson. The report and accounts, both of which were of a very encouraging character, were adopted. Sir Hickman Bacon was warmly thanked for his past services as president, and he was unanimously re-elected. All the vice-presidents, with the exception of Major Laycock, D.S.O., whose place is taken by Earl Brownlow (Lord Lieutenant of Lincolnshire), were also re-chosen. The meeting approved of the suggestion to appoint the following members on the committee :—Messrs. A. A. Padley and W. R. Pennell (as representatives of the Lindsey division), Mr. G. Godson and Dr. Gilpin (as representatives of the Kesteven division), Dr. Miller and Dr. Mason (as representatives of the Holland division), and Capt. Newsum, Capt. Gleed, Dr. Lowe, and Mr. W. A. Tomlinson. The hon. solicitor (Mr. C. Nelson) and hon. secretary (Dr. E. H. Cragg, of the Old Hall, Billingborough) were re-elected. A revised and amended set of rules were before the meeting, and these were unanimously approved. The club now musters between 150 and 160 members.

A proposal is on foot to hold an Automobile Bohemian Concert and Lantern Lecture at the Royal Hotel, Grimsby, under the club's auspices, some time in the spring.

North-East Lancashire A.C.—The third annual dinner of the members of this club took place at the Old Bull Hotel, Blackburn, last week, when a delightful evening was enjoyed by all those who were fortunate enough to be present. Mr. William Birtwistle, J.P., occupied the chair, and amongst those supporting him were the Mayor (Councillor James Kay, J.P.), Mr. I. G. Lewis (Chief Constable), Mr. L. Beard (Town Clerk), Mr. M. Brothers (Magistrates' Clerk), Alderman S. Crossley, J.P., Dr. R. A. Gray, J.P., Mr. F. T. Marwood, and Dr. Musson (Clitheroe). From all parts of the country motorists had gathered together, and during the evening a charming selection of music was discoursed by Mr. Dixon's orchestra. Following the usual loyal toasts, the toast of the North-East Lancashire Automobile Club was proposed by the Mayor in very happy terms.

Mr. A. Birtwistle, in responding, gave an interesting forecast of the club's programme for the ensuing season. In all probability, he said, the club runs would be dropped entirely, as their success in the past had not been too pronounced, and they would content themselves with competitions and social events. They had arranged to hold a 200 miles non-stop run to Carlisle and back, a 100 miles non-stop run to Kendal and back, and also a hill-climbing competition. Medals had already been promised for the first two items, and he was able to announce later that the Mayor had, in addition, offered medals for the hill-climbing competition. In regard to the social side of the club, already many promises from prominent gentlemen in the county had been made to entertain the members of the club. On the whole he thought a very good season was in prospect. Later, in distributing the medals for the 100 miles non-stop run, the chairman pointed out that out of 18 cars that started, 12 had earned medals, for having completed the entire journey without a single stop, a fact which spoke well for the reliability of the present-day cars. The successful competitors were :—Mrs. Riley (Haslingden), Mr. S. Marwood, Mr. H. Lonsdale (Accrington),

Mr. W. Smith (Accrington), Mr. H. Blake (Accrington), Mr. S. Briggs-Bury (Accrington), Mr. Fred Birtwistle, Mr. A. Birtwistle, Mr. W. Birtwistle, Mr. Walsch, Mr. Broadley (Accrington), and Mr. Spencer.

The toast of "Automobilism" was entrusted to Dr. Musson, of Clitheroe, who, after criticising the terms of affiliation of the club with the parent body, said it was time that the Lancashire clubs interested themselves more in automobilism and devised some method of fostering the sport in the county. He suggested the clubs federating as one means, and another that they should become members of the Motor Union.

The Chief Constable (Mr. I. G. Lewis), in responding to the toast of "The Guests," was glad, he said, to be able to give the automobilists in his district a good character for the past year. He was not one who believed in taking proceedings immediately, preferring to give a caution either directly or through official sources, which he found had, as a rule, a better and much more effectual result. He was glad to be able to say that, as chief constable of the borough, the members of the club had always been very careful, and had shown great skill in driving in his district.

The chairman, in responding to the toast of his health, disagreed with the disparaging remarks of Dr. Musson in regard to the affiliation with the parent club. He maintained that it was mainly through the efforts of the parent club that the Motor Car Act was passed, and considering the good it had done all over the country, in avoiding appeal cases, etc., the expense was very small.

Nottinghamshire Automobile Club.—Arrangements have been made by the club for holding a race meeting on the Skegness Sands in July next. The agent for the Earl of Scarborough, who owns the foreshore, has undertaken to stake and protect the course. All other arrangements for the races will be in the hands of the club, and we understand a subscription list has been opened by the residents of Skegness to provide prizes for the events.

In addition to the races at Skegness, other interesting events are being arranged for the summer. These will include an open event in May for hill climbing and a non-stop run, for which one of the members (Mr. W. F. Foster) gives a cup to be competed for by members. Mr. J. C. Wilson, another member, is giving a cup for an event in the summer which has not yet been definitely decided. An invitation to the Motor Union has been extended by the Club for a visit to Nottingham during the summer.

It has been determined by the Executive Committee to take energetic steps in inducing County Councillors to put pressure on the County Council to try and obtain universal lighting of vehicles.

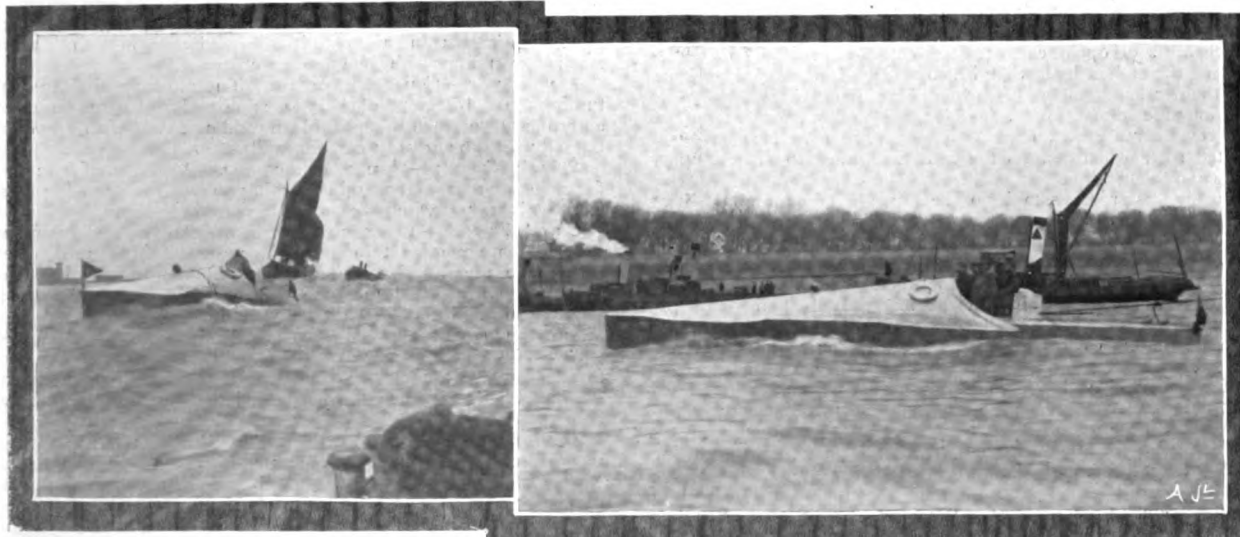
Peterborough and Counties Automobile Club.—At a meeting of the members of this club, held at headquarters—the Great Northern Hotel, Peterborough—on Friday evening, February 24th, a letter was read from the Marquis of Exeter accepting the position of club president. Communications were also received from the Hon. Leonard Brassey, of Apethorpe Hall; Mr. G. C. W. Fitzwilliam, D.L., J.P., of Milton, and others, consenting to become vice-presidents. The principal business of the meeting was to adopt a set of rules. The secretary (Mr. E. H. M. Wood) submitted a list drafted from those of the Northamptonshire Automobile Club and the Peterborough and District Motor Club, which have now amalgamated under the above title. Various alterations and additions were made, and the set was then adopted. Mr. Richard Winfrey, the prospective Liberal candidate for South-west Norfolk, who was selected for the office of club captain, has written expressing his willingness to act in that capacity.



Mr. Macdonald's Welcome Home.—On his return from America, Mr. Arthur Macdonald was entertained by the heads of departments of the firm of S. F. Edge, Limited, on Thursday of last week, at a very pleasant little dinner given at the Florence Restaurant, when the valuable and artistic trophies won in Florida by Mr. Macdonald, on the already famous 6-cylinder Napier car, were on view. Mr. S. F. Edge, who occupied the chair, showed the pride that he naturally takes in the successes of his pupil, and other speakers also referred in well-deserved terms of admiration, to the pluck and perseverance which are

so thoroughly characteristic of Mr. Macdonald; while Mr. Macdonald himself spoke in high praise of his mechanician, Mr. L. Lewis, and expressed his admiration of the car, of its designer, Mr. Napier, and of his firm. Many good stories and reminiscences of early triumphs and other experiences were related, and not the least satisfactory feature of the gathering was the evidence that it gave of the excellent feeling that exists between employer and employed—an important matter indeed for the lasting success of any firm. Unfortunately, both Mr. Napier and Mr. Cecil Edge were unavoidably absent through illness.

MOTOR BOATING.



"NAPIER II" GOING FOR A TRIAL RUN.—Last year, it will be remembered, the hull of "Napier II" was damaged during the heats for the B.I.C. The hull has now been rebuilt and several modifications in the general arrangement have been made, although the two engines are the same as before.

British International Cup.—July 1st is the closing date for entries. This, we learn, is provided for in the rules. The entry form for boats to represent Great Britain has now been issued by the Automobile Club. The entrance fee payable to the A.C.G.B.I. is the same as that to the A.C. de France, namely, £20, one half of which will be returned if the boat is actually present at the start. If more than three entries are received, that being the maximum number of boats that can represent Great Britain, the A.C.G.B.I. will hold an eliminating race for the selection of the three British boats. Three boats have already been

entered, and as there is a prospect of several others, an eliminating race is highly probable, and in itself should prove an extremely interesting contest.

Calais to the Thames Race.—Sir David Salomons, Bart., has offered a cup in connection with this race. Although the Thames Conservancy Board will not permit the actual race to continue higher up the river than Port Victoria, the proposal that the boats should proceed up the Thames to London in procession will in all probability be carried through, and the exhibition of the competing craft duly held within hail of Westminster Bridge.



AERONAUTICS.

M. SANTOS DUMONT is, we understand, building a new airship, which is to attain such high speed that it will deserve the name of a racer. The total length of the gas-vessel is to be 41 metres, and the total weight 43 kilos. A characteristic of the new design will be the stiffening of the gas-vessel itself by bamboo rods connected with gussets of the material forming part of the envelope, the gussets being constructed in the same way as were the flaps in the old Santos-Dumont airships. The new machine is to have two ballonettes instead of one. The larger of these, which will be placed about the middle of the gas-vessel, will be of spherical shape, and capable of extending itself in all directions. The smaller will form the interior of the forward conical point of the gas-vessel, the object, of course, being to maintain the rigidity of the front end under all circumstances, even when a considerable amount of gas has been lost. In this arrangement M. Santos Dumont hopes to preserve the rigidity of the front portion of the balloon under the most unfavourable conditions. The hull itself, which is, in the main, of the familiar type, is suspended from the air-vessel by 13 wires, each eight-tenths of a millimetre thick, attached to the bamboo yard which serves to

stiffen and reinforce the gas-vessel. The motive power will be furnished by a 2-cylinder Peugeot engine developing 14-h.p., the cylinders being slightly inclined to one another. The total weight of the motor is only 26 kilos., which is believed by the constructors to be a record in the way of lightness for the power developed. The propeller, which is mounted in front of the hull, is of 1.7 metres diameter, and is to revolve at a speed of 2,000 revs. per min. The rudder, which is of the ordinary type, is mounted at the rear of the hull. The envelope, which is now practically ready, has been built by M. Lachambre, who, as our readers are aware, has constructed this portion of all the previous Santos-Dumont airships.

The gas-vessel of the new airship has recently been inflated under very inauspicious weather conditions, as heavy snow fell upon it during the process. The new gas-vessel when actually filled with gas is amazingly needle-shaped to the rear, though slightly porpoise-headed in front. In fact, as the above particulars show, it is altogether much longer, thinner, and more pointed than any of the previous models which M. Santos Dumont has adopted.

STEEL AS APPLIED TO MOTOR CAR CONSTRUCTION.*

By J. S. Critchley, M.I. Mech.E.

Open-hearth Siemens-Martin Processes.—The process known as the Siemens or open-hearth process consists essentially in decarburising the molten bath of pig iron by the addition of pure hematite ore, the necessary amount of carbon being afterwards added by the addition of ferro-manganese. The furnace employed for this purpose is a reverberatory one, fired by gas—that is, a furnace having a vaulted roof, which deflects the heat downwards on to the upper surface of the metal.

During this process samples of metal can be taken, and the heat regulated from time to time, so that it is possible to test the quality. The phosphorus is not eliminated, so that as in the Bessemer acid process the pig iron used must be free from this impurity. In the Siemens-Martin process the same open-hearth type of furnace is employed, but the materials used are good pig iron in which is dissolved malleable iron scrap, steel rails, &c., the requisite amount of carbon being also added in the form of ferro-manganese.

Basic Open-hearth Steel.—In this process the hearth is lined with dolomite or some basic material in order to remove the phosphorus, as in the basic Bessemer process. The steel by this process can be made very low in carbon—or, as it is termed, mild—owing to the length of time taken to remove the phosphorus. The Siemens-Martin process is now generally employed for steel of high-class quality, mainly due to the fact that samples can be taken from time to time to ensure the quality being uniform in one or more furnaces. As a Siemens-Martin hearth can be made for a capacity of up to 150 tons, and as the quality of two or more furnaces can be guaranteed uniform, it is obvious that very large ingot castings can be made. Castings for large guns can be made by this process. The terms acid steel and basic steel are often referred to, but it must be understood that these terms do not refer to the quality of the steel, but to the method or process of manufacture. It is quite possible to get by either process steels of exactly the same chemical composition.

The next process in steel manufacture after casting the ingot is the forging. The strength of both iron and steel is greatly increased by forging. For this purpose various kinds of hammers are employed; also the hydraulic forger and the rolling mill, the special uses of which it is not necessary to enter into.

Steel is characterised by the property of being hardened or softened by sudden or rapid cooling, by the process known as tempering. The higher the percentage of carbon, the greater is the property of being hardened. Steels may contain 0.1 per cent. to 2 per cent. of carbon, within which range we get steels at one end very soft, and at the other end steels very hard and brittle.

Steels containing over 0.5 per cent. of carbon are termed hard steels or high carbon steels, and those containing less than 0.5 per cent. are known as mild, soft, or low carbon steels. The uses and employment of different kinds of steel depends upon the percentage of carbon, the high carbon steels being almost exclusively used for the making of dies and cutting tools. For structural purposes, steels with more than .45 per cent. of carbon are seldom used, as the higher the percentage the greater the risk. Steel with anything above a small percentage of phosphorus, say .04 per cent., is not suitable for any purpose where it is subjected to shock or vibration. Sulphur also has a detrimental effect, producing what is known as "hot shortness"; that is, it makes the metal difficult to work, and should only be present in about the same proportion as phosphorus, i.e., 0.04 per cent. Nickel chromium and vanadium have a marked effect on steel, increasing both the ultimate stress and elastic limit, and it is in connection with alloys with these metals that some remarkable results have recently been obtained.

A steel which has been hardened can have that hardness reduced by heating and subsequent cooling, the exact temper or hardness being fixed by cooling out rapidly at specific temperatures. The degree of hardness required depends also upon the percentage of carbon present, as, for instance, a steel with 0.1 per cent. of carbon quenched out cold could be bent double, but steel with 0.9 per cent. carbon when treated in the same manner is as brittle as glass. Steels containing less than about 0.15 per cent. of carbon when heated to a full red heat do not harden perceptibly when suddenly placed in water, but with a percentage of 0.2 per cent. or over, the hardening by rapid cooling at once becomes apparent, and increases with the percentage of carbon up to about 1 per cent. Usually high carbon steels are very pure, and are made by the crucible process.

Regarding high carbon steels, Mr. Henry Seeborn gives the following specification on their special properties:—

* Excerpt from a Paper read before the Automobile Club on February 9th.—Continued.

Razor Temper.—1½ per cent. This steel is so easily burnt by being overheated that it can only be placed in the hands of a very skillful workman. When properly heated it will do twice the work of ordinary tool steel for turning chilled rolls, &c.

Saw File Temper.—1½ per cent. carbon. This steel requires careful treatment; and although it will stand more fire than razor steel, it should not be heated above a cherry red.

Tool Temper.—1½ per cent. carbon. The most useful temper for turning tools, drills, and planing machine tools. In the hands of an ordinary workman it is possible to weld cast steel of this temper, but only with the greatest care and skill.

Spindle Temper.—1½ per cent. carbon. A very useful temper for circular cutters, very large turning tools, taps, screwing dies, &c. This temper requires considerable care in welding.

Chisel Temper.—1 per cent. carbon. An extremely useful temper, combining, as it does, great toughness in the unhardened state, with the capacity of hardening at low heat. It is consequently well adapted for tools, when the unhardened part is required to stand the blow of a hammer without snapping, where a hard-cutting edge is required, such as cold chisels, hot sets, &c.

Soft Temper.—¾ per cent. carbon. This temper is adapted for tools where the chief punishment is on the unhardened part, such as cold sets which have to stand the blow of a very heavy hammer.

Die Temper.—¾ per cent. carbon. The most suitable temper for tools where the surface only is required to be hard, and where the capacity to stand great pressure is of importance, such as stamping or pressing dies, boiler cups, &c. Both the last-named tempers may be easily welded by a mechanic accustomed to weld cast steel.

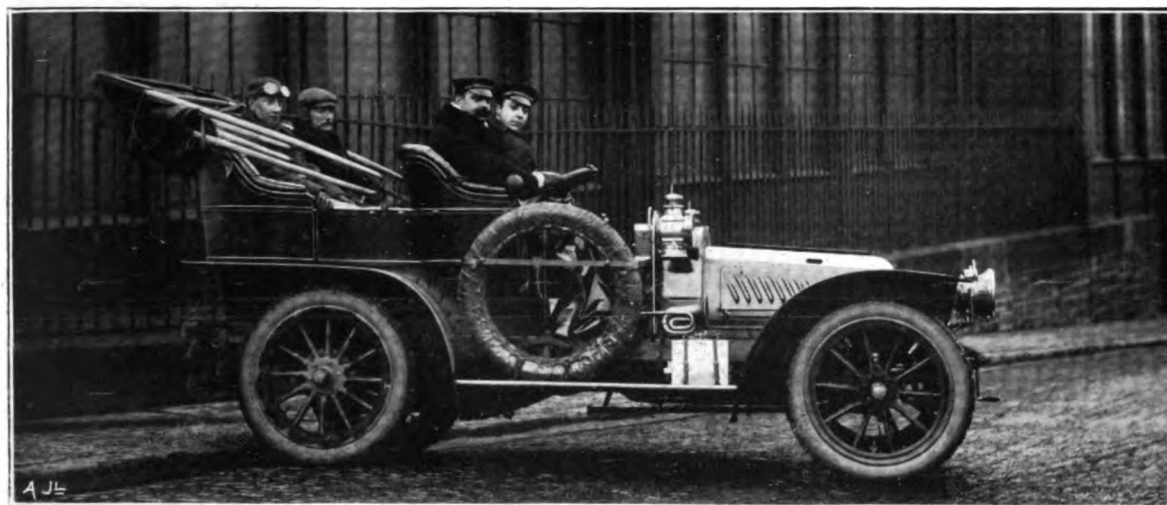
Carbon exists in iron in at least three different states, which are termed (1) graphite carbon, (2) cement carbon, and (3) hardening carbon. (1) Carbon in the graphitic form is very rarely found in steel, but mostly in cast iron. It is the excess of carbon which, when the metal solidifies, it is not able to retain. (2) Cement carbon. This form of carbon is found in unhardened steels; its chemical formula is Fe₃C. (3) Hardening carbon. Carbon of this form is detected in quenched steels, and the hardness of the steels increases with the percentage of this form of carbon, only, however, up to a certain point, after which the hardness diminishes. For a large percentage of this carbon to be formed rapid cooling is necessary. Both the cement carbon and hardening carbon can be chemically separated, although the cement carbon is intermingled with the iron, whereas in the hardening carbon it is in solution with the whole of the iron.

Dr. Stansfield sets out the solution theory in the following terms: "The solution theory of carbonised iron affirms that this substance is, when fluid, a solution of carbide in iron, and that under certain conditions the solidified mass also forms a solid solution. It further affirms that these liquid and solid solutions obey the ordinary laws of solution which have been fully studied in the case of aqueous, saline, and organic solutions. The solution theory can therefore be invoked to explain both the mode of solidification of carbonised iron and the molecular changes that take place after solidification. The experimental data, which enable the theory to be applied, are mainly afforded by the pyrometer and the microscope used in conjunction with chemical analysis, but all the other physical and chemical properties of carbonised iron must be studied for the sake of the contributory evidence they afford."

The heat treatment of steel has to be very carefully considered in its manufacture; in fact, for steel to be of its best quality, the heat treatment has to be very carefully watched from the time the ingot is cast to the completion of the finished article. Any application of heat beyond certain limits may have the most disastrous effects, whilst judicious heating effects very great improvement in the state of the metal, and brings it to its finest and most perfect state for the engineer. For instance, if a bar of steel is heated to full welding heat, allowed to cool, and then broken, it will be found to have a very crystallised fracture, and be comparatively brittle, whereas the same metal, if worked up and hammered, will be fine in structure and good metal. All steels are improved by heating to a temperature of about 1148 deg. Fah. after rolling, forging, or other work being put upon them, in order to bring the material into a normal state by removing all internal strains which may have been set up by previous operations.

The temperature of annealing varies with different qualities of steel, also the duration of the heating process, and the rate of annealing, which may be slow or rapid; these and other factors have to be taken into consideration. It is found that in many cases annealing and quenching in oil and reheating to a comparatively low temperature and slowly cooling improves the quality of the steel to a large extent, and it is only in recent times that any scientific data has been evolved to determine the temperature.

(To be continued.)



For the third consecutive year Mr. J. W. Stocks has journeyed to the Edinburgh Motor Show from London on a De Dion Car. In 1903 he drove an 8-h.p. single-cylinder car; on February 26th, last year, he made a non-stop run in 24½ hours on a 12-h.p. two-cylinder De Dion, and this year he selected the 15-h.p. four-cylinder De Dion, on which Mr. Stocks is seen in our photograph at the wheel. This picture was taken immediately after his arrival in Edinburgh at the Exhibition on Saturday afternoon. During the 402 miles' run we learn there was no involuntary stop of the engine, the gross time occupied being 20 hrs. 55 mins., which was reduced by voluntary stoppage for petrol, refreshments, &c., by 1 hr. 25 mins., leaving the actual driving time at 19½ hrs. Mr. Stocks drove throughout the whole journey and was accompanied by Mr. Massac Buist of the "Morning Post" (on Mr. Stocks' left), and Mr. Douglas Miller of the "Referee" (on the right in the tonneau). A schedule time was prepared beforehand, so that the possibility of running like a train to a time-table might be tested. Throughout the first half of the journey the punctuality was almost painful, being either one minute in advance or possibly behind, the schedule time, at various points such as Hitchin, Grantham, Doncaster, Durham, &c. Heavy snow on crossing the Borderland however upset calculations somewhat, the greasy roads preventing a good speed average being maintained. In spite of all this, however, the Edinburgh Exhibition building, at Waverley Market, was reached at 4.55 p.m. on Saturday, the start having taken place on Friday evening. The Dunlop non-slipping tyres with which the car was fitted, behaved admirably throughout.

The Edinburgh Motor and Cycle Exhibition.—

On Friday, February 24th, the Eighth Annual Show was opened in Waverley Market, Edinburgh. In former years, of course, bicycles and tricycles attracted the attention of the visitors, but now these give place to the more up-to-date motor car. Several of the exhibits which attracted such attention at Olympia are again to be seen at the Edinburgh Show, notable among them being the Brotherhood, Argyll, White, Mercedes, De Dion, and Albion cars. Mr. A. K. Dempsey was to have shown the Ariel chassis, but they were unfortunately destroyed in the recent Long Acre fire. In the tyre section, the Palmer Tyre Company, the North British Rubber Company, and the Continental Company are well represented.

The organisation of the Exhibition is under the direction of Mr. A. K. Dempsey, while Messrs. R. Maule and Sons attended to the decorations, and Lieut. Chas. Godfrey's band adds considerably to the enjoyment of those who visited the Show.

Manchester Automobile Show.—The Second Annual Show, organised by the Manchester and District Cycle Traders' Association, Limited, was opened on Friday, February 24th, by the Earl of Shrewsbury and Talbot, with Alderman Rudman, J.P., in the Chair, supported by Mr. A. R. Albert, president of the Association. For a provincial Exhibition this is extremely representative, and many of the identical cars exhibited at Olympia are on view. Among the hundred or so cars, gathered in St. James's Hall, are the parts of the 12-h.p. Siddeley which recently successfully completed its 5,000 miles official trial. These are exhibited by the Wolseley

Company—who now own the Siddeley Company—and attract as much attention as they did when exhibited at Olympia. Those firms who were not exhibiting themselves were for the most part represented by their agents. Messrs. Newton and Co. showed Daimler, Darracq, Clement, and De Dion cars, the Belsize Motor Company had their own stand, as had Messrs. Humber, Limited, while Messrs. J. H. Lawton made a fine display of Napier and Mercedes cars. Among heavy vehicles on view is one by Messrs. Fodens, Limited, which was successfully driven from Sandbach to the Show in under six hours. The Shrewsbury and Challiner Tyre Company attract considerable attention with their display of heavy vehicle tyres, particularly those built for 'bus work.



BOOKS FOR REVIEW.

PUBLICATIONS RECEIVED.

Marshall's Practical Manuals, No. 3. Petrol Motors Simply Explained. By T. H. Hawley. London: Percival Marshall and Co. 1s.

The Law Affecting Motor Cars. By W. Lucas and A. C. Crane. London: Reeves and Turner. 5s.

Treatise on Coach Painting. By Wm. Simpson. London: J. and C. Cooper, Long Acre.

The Inventors' Guide. By James Roberts. London: John Murray. 2s. 6d.

The Wolseley Light Car Handbook. Birmingham: The Wolseley Tool and Motor Car Company, Limited. 3s. 6d.

Gas and Petroleum Engines. Edited by A. G. Elliott, B.Sc. London: Whittaker and Co. 2s. 6d.

Catalogues.

Winton Vertical Four-Cylinder Motor Catalogue. Cleveland, Ohio: The Winton Motor Carriage Company.

Speedwell Motor Catalogue. London: The Speedwell Motor and Engineering Company, Limited.



Above we give two photographs showing the result of the very disastrous fire in Long Acre, which we recorded last week, by which, amongst a number of other buildings, the entire premises of the Ariel, Swift, and Mercedes-Cannstatt showrooms were entirely gutted. In connection with this fire, a smart piece of business was accomplished by Mr. Harvey du Cros, Junr. Within a very short time after the fire had destroyed the premises of the Ariel Company, he had completed arrangements with the Gladiator Company of 8 and 9, Long Acre, to carry on operations there pro tem., and early in the afternoon, announcements by boardmen and otherwise were heralding this fact through the streets of the West-End.

Motor Boats—Present and Future.—On Thursday, February 23rd, Mr. W. F. Evans read a paper on this subject before the members of the Automobile Club. In his opening remarks, Mr. Evans drew attention to some of the leading considerations in respect to wave-making and speed, and said that he proposed to divide the boats considered in his paper, approximately into two classes, viz.: "Those whose motor power will not drive them at a speed that is in excess of their maximum wave-making point, and those that are so powered that their normal condition of running is beyond this point."

Continuing, Mr. Evans said, "I presume it has occurred to all who have given the question of marine propulsion by internal combustion engines consideration, that the whole crux of the question is weight—pounds per unit of power. With the steam engine I refer to the ordinary commercial steam engine, with its boiler, condenser gear, feed pump, &c., one has a weight for sustained b.h.p. of 206 lb., which makes it impossible to get a launch like the 'Nina' to carry such a weight without possessing such a 'midship's area for her length that the maximum wave-making point would not be reached, much less overcome."

"An extraordinary increase of horse-power per unit of weight has placed us on the top part of the curve, the part where it gets convex—that is to say, we really start under very favourable conditions, and those designers who have made use of these conditions will get proportional results."

"One of the most fascinating and instructive things that I have ever had the good luck to observe, was a dynamometer through which some 40 ft. models were being towed by Messrs. Yarrow's last year. They quickly reached their limit of easy pulling, somewhere about the speed the model could have been rowed by four men, and then the pull came on. As the torpedo boat got away the pull increased so much that I, knowing what the pull would have to be at 25 knots, gave it up as a bad job at 14 knots. I think from 14 to 18 was a critical time, and then it stopped, and gradually fell until we reached our limit of speed."

"One day I hope to be able to participate in experiments that will allow me to plot the curve far enough to enable us to see over the turn of the hill that has been so hard to climb, and to catch a glimpse of the 'straight road' of the fair plain of ' $V \sqrt{H.P.}$ '"

The remainder of the paper was devoted to a discussion of the merits and demerits of the numerous boats, of which a number of lantern-slide illustrations were thrown on the screen.

CORRESPONDENCE.

* * *The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.*

DRIVING ALL FOUR WHEELS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I believe it would be with considerable interest that the majority of your readers would receive the opinion of those informed as to the following questions:—

Is there any real, practical advantage in the driving of all four wheels of an automobile, as instanced in the latest Spyker production, and, if so, does this added advantage, whatever it may be, more than balance the increased cost and complication that such a construction must incur?

Presuming that the Spyker Company find their present endeavour to be satisfactory, is it not to be rather wondered at that they do not go a step farther, and not only make each wheel a steerer, but equip each wheel with a powerful metal to metal brake?

Yours truly,

February 8th.

W. G. EDWARDS.

MOTOR CAR INSURANCE.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—We have read with much interest the letter from Mr. A. J. Wilson in this week's issue of your journal, as we are now starting an Association for the Mutual Protection of Car Owners upon the lines Mr. Wilson indicates.

Mutual insurance is practically perfect in theory, and if the Automobile Mutual Insurance Association is well supported by motorists, the system must undoubtedly prove thoroughly satisfactory in practice.

The system makes for economy in every way, for not only does it save that surplus of premium over the actual risk, which is the professional underwriter's profit—the members merely paying the actual price of the contingencies of the year plus working expenses—but the working expenses themselves will be very much less than the cost of running an ordinary insurance company.

The mutual principle has been applied with considerable success

by, for instance, the Bolton cotton trade for fire risks, and we have ourselves, for over twenty years, managed Associations covering marine risks upon the same system, and we are convinced that the present cost of insurance can be largely reduced under this co-operative method of protection properly supported by car owners, and even reduced to a figure at which those owners, who may at present be content to carry their own risk rather than pay the premiums demanded by the companies, will find it no longer worth their while to be uninsured.

We may add that some years ago Mr. Justice Mathew, in the course of one of his maritime judgments, declared that, "Mutual insurance is the most laudable and the most excellent way of effecting insurance," and certainly the system is so inherently sound that its application to the needs of motorists only needs effective recognition at their hands to ensure its success.

Yours faithfully,

J. AND R. BOVEY.

Exchange Chambers, St. Mary Axe, E.C.

Cordingley's Exhibition.—Only a fortnight separates us from the opening of Messrs. Cordingley's Motor Exhibition at the Agricultural Hall, which makes a start on Saturday, March 18th, and will remain open until the 25th instant. We learn that the space is fully occupied in the main hall, and that altogether a very interesting exhibition is assured. A large number of British exhibitors of light pleasure and touring cars, light delivery vans, &c., will have important exhibits, and several firms whose new models could not be got ready in time for the shows which have already taken place, will be represented. Most of the leading Continental makes of car will be shown. Heavy motor vehicles will be a strong feature of the exhibition, the minor hall being, as before, entirely devoted to this section of the exhibits, whilst it has been found necessary to provide further accommodation in the main building for a number of motor 'buses, cabs, luries, &c., for which no space was available in the minor hall. In the galleries and other small halls of the building, automobile components and accessories will be exhibited, a large number of exhibitors in this section having applied for space. The display of balloons and airships arranged by the Aero Club is again to be a feature of the exhibition. The Motor Van and Wagon Users' Association, during the show week, will hold its annual meeting at the hall, and on March 21st the annual meeting of the Motor Union will also take place at the Agricultural Hall.

A Motorist's Diary.

Quite one of the most complete compilations in the form of a pocket diary for motorists' use which has yet come to our notice is that which we have just received from the Wolseley Company. This little book, in addition to the usual

space for memoranda, has a very complete list of hotels, garages, and petrol agents, alphabetically indexed under their respective towns. Besides this, there is a list of the registration marks, as well as condensed particulars relative to the cost of licences. Postal information and numerous tables are also included, and a useful addition is a chart on which the owner can plot his weekly mileage total and thus see at a glance the relative distance he has travelled throughout each week of the year.

THE Marquis De Dion has been detailing to his compatriots his impressions of the Olympia Show in the columns of *L'Auto*. It was a complete surprise for him, and he declares that the results obtained by the English are most depressing to Frenchmen, both from the industrial and commercial point of view. The Marquis further counsels his countrymen to refrain from living in a fool's paradise, and believing that because the French industry has had a long start, the English manufacturers will never catch them up. As regards the commercial vehicle the Marquis is of opinion that Great Britain is already ahead of France, and he fears that the future will see foreign countries gradually depriving France of her lead in her own particular speciality—the *car de luxe*.

Our Many Cranks.—"Once the motorist has begun to talk one must be content to listen and admire (it is impossible to get a word in edgewise). Yet the motor maniac is a much nicer person than the ordinary crank. He bores one far less than the inveterate bridge player, the good shot, the skilful fisherman, the theatrical expert, or the old furniture collector."—*Madame*.



An up-to-date hunting holiday in the wilds of America! A White Steam Car coming out of camp to collect the "bag" of deer.



At the congratulatory Dinner which was accorded to Mr. Arthur Macdonald upon his return from his triumphs on the six-cylinder Napier in Florida, the artistic trophies which Mr. Macdonald had brought back with him, were one of the features of the entertainment. We are able to reproduce on this and the next page photographs of the two most important of these trophies secured by the Napier Cars. In the above is shown the Thomas Trophy, which was presented by Mr. E. R. Thomas, of New York, for a 20-mile race, which Macdonald won in 13 mins. 27 secs.

A NUMBER of automobilists in Warwickshire have determined to found a county club, with headquarters in Leamington.

THE Town Council of Falkirk, who some time ago applied to have the speed of motor cars restricted to 10 miles an hour on certain highways in the burgh, have withdrawn their application.

THE King's Daimler carriage has been libelled in the pages of the general press. It has been stated that the breakdown in Richmond Park on February 11th took place when the King was on his Daimler car. This, we understand, is *not* the case.

MACHNOW, the Russian giant, is of a cosmopolitan turn of mind, and we learn in connection with his trip to Crawley (an illustration of the start of which we gave in last week's number) that Mr. John S. Goodhart's 15-h.p. Orleans car shared the honour with the 9-h.p. Oldsmobile in conveying this stupendous man to Crawley and back. After a halt by the way at Sutton, Machnow completed the dozen odd miles to Crawley on Mr. Goodhart's car, returning later to London in the same vehicle.

WE have chronicled from time to time the round-the-world tour of Mr. Glidden on his Napier car, and recently mentioned that he had arrived at the southernmost point of New Zealand. More recently he has betaken himself to the island of Fiji, having now covered, he says, 20,100 miles. The car has naturally excited much astonishment amongst the natives, who, we are told, have christened it "the God of Fire," we presume in Fijian, or whatever the language there affected may be.

SOME of the daily papers have been a little hasty in heading paragraphs "No More Motor Fire Engines," on the ground that the chairman of the Fire Brigade Committee is not in favour of petrol-propelled appliances of this kind, for the London County Council has only just taken delivery from Messrs. Merryweather and Sons of one of the "Fire King" machines of the type which we described some considerable time back, as being supplied by them to Australia and several of our municipalities. The "Fire Kings," however, are steam propelled.

SINCE dealing with the subject recently, it is reported that upwards of 1,000 London cabmen have sent in applications to be allowed to join the training classes in motor cab driving which the Cabmen's Union has organised. The privilege of driving motor cabs is, we understand, to be allotted by ballot, according as the vehicles are placed on the streets. There is great enthusiasm on the part of the cab drivers, particularly the younger members of the profession. Doubtless they recognise the increased opportunities of earning which the motor cab presents.

MR. S. F. EDGE informs us that, encouraged by the splendid successes of the 6-cylinder Napier racer recently at Florida, the Napier Company are building a new racing car to compete at these meetings next year, and to be driven as before by Mr. Arthur Macdonald. The company are prepared to build similar cars to the order of any private owner if they receive the orders sufficiently early. The new racers will be guaranteed to be considerably faster than this year's successful car, so that owners of the new vehicles may anticipate being in a position to make further inroads on the world's records.

As we have already announced, a series of lectures is being delivered by Mr. Currie before the Ladies Automobile Club, on practical automobilism, with demonstrations. The lecture, which Mr. Currie will deliver on Wednesday, March 8th, promises to be of very special interest, as it will be devoted to the steam engine as applied to motor car propulsion, and will be demonstrated by means of the 15-h.p. White chassis which was on exhibition at the Olympia Show, and proved a centre of attraction to such a large number of visitors. As our readers will remember, the new White model provides a free engine, and this will enable Mr. Currie to demonstrate the inter-action of the various appliances constituting the White system in a way which has never previously been possible. The steam car in its most perfect form continues to attract an increasing amount of attention, and we have no doubt that Mr. Currie's lecture, devoted to that subject and practically demonstrated in the manner described, will be one of the most satisfactory and best-attended of the series.

IN the case of Mr. E. J. Harrison who was summoned at Blackheath recently on the usual charge, the constable maintained that the speed at which he had proceeded was $19\frac{1}{2}$ miles an hour. The magistrate, who was evidently progressive, dismissed the charge, observing that "there were some old-fashioned constables who had old-fashioned ideas and treated motors as omnibuses, but that we were now living in an age in which we must go a trifle faster." On the common charge of not producing the licence immediately, Mr. Harrison was fined 3s. and 2s. costs, a sufficiently small fine to show the magistrate's view of that form of petty persecution.

THE Ripley Road is destined to lose one of its most distinguishing features—Sergeant Jarrett, who has for so long been one of the semi-permanent objects in the landscape, having been promoted to the post of inspector and transferred to the Egham district. As it is unusual for inspectors to take actual part in the organisation of police traps, we may conclude that Inspector Jarrett will in future largely have to forego the delights of cross-examination in motor car cases. We trust that the tactics which have been so long associated with Sergeant Jarrett's name in the neighbourhood of Ripley will henceforth experience a certain amount of modification.

"Not only we . . . have loved the People well." The Countess of Warwick has espoused the cause of Labour candidates with remarkable vigour, and has undertaken a campaign in favour of labour representation (assisted by her 40-h.p. motor car), which is probably unprecedented on the part of a lady electioneer, at any rate since the days of the celebrated Duchess of Devonshire. The Countess has decided on visiting by means of her car (which, in accordance presumably with the Jacobin tradition, has been painted red for the occasion) some forty-five towns where Labour candidates are to contest the seats, as far distant from one another as Glasgow and Croydon, and Woolwich and Swansea. When the next General Election takes place, we may consequently anticipate a very considerable strengthening of the Labour vote in the House of Commons.



COMMERCIAL POINTS.

THE Sultan of Johore, who is widely known as an enthusiastic sportsman, has recently purchased a 90-h.p. Mercedes car which has been fitted with a tonneau body. In order to facilitate starting the engine, this fine vehicle has recently by his orders been fitted by Messrs. Charles Jarrott and Letts with a C.J.L. supplementary ignition, which we understand is working without a hitch, and is a source of considerable satisfaction.

THE Speedwell Motor and Engineering Company, Limited, have forwarded us their most recent price list, which is exceedingly well got up and copiously illustrated, showing all their different types of car, from the little 6-h.p. 2-seater at 125 guineas to the large 25-h.p. touring car at £590. The price list also contains detailed illustrations of the engine and gearing, and reproductions of some of the prizes that the Speedwell cars have won.

MR. S. W. HUMPHERY, A.M.I.E.E., has joined the firm of J. W. Brooke and Co., Limited, of Lowestoft, as a director.

THE advertising of motors has called forth much ingenuity and much artistic effort from several firms, and in the latter branch the small poster issued by Messrs. Brooke and Co. is well deserving of notice. The conception of a Brooke motor boat overtaking a torpedo destroyer is a bold one, and the execution of the colour printing is breezy in the extreme.

THE proprietors of Pratt's Motor Spirit wish us to correct a statement which recently appeared in the *Daily Mail* to the effect that petrol cans, when emptied of their contents, should be filled with

water. This, they state, is a wrong thing to do, and they deprecate the action in connection with their cans, asking that they be used for no other purpose than the one originally intended for them, viz., that of containing motor spirit. They point out that to fill the cans with water renders them useless for motor spirit afterwards, and any of their cans so used will render the deposit money upon them invalid.

THE Wolseley Company determined, after the close of the Olympia Exhibition, to send one of their 18-h.p. Siddeley cars to be at the disposal of their Scotch agents for trial runs during the Edinburgh Show, and Mr. Sidney Girling accordingly started with one of these vehicles at 12.30 midday on Monday last and drove straight through to Edinburgh. There was no idea of making a record run or even a non-stop run, but Edinburgh was reached at 8.5 the following morning, the total time occupied between the two capitals being accordingly 19 hrs. 35 mins. Under the unsatisfactory weather conditions prevailing this constitutes a splendid testimonial to the reliability and steady running powers of the Siddeley car.

MR. JOHN STIRLING, who has been responsible for many of the earliest attempts to use motor omnibuses in ordinary everyday work, has, we learn, taken up his permanent residence in London for the special purpose of further developing his ideas in connection with motor omnibuses for the metropolis. As far back as 1897, Mr. Stirling's firm, Messrs. J. and C. Stirling, of Hamilton, N.B., started omnibuses for public service, and during the past three years Mr. Stirling has been very carefully studying the problem of London traffic. He has now associated himself with a new company, under the title of Stirling's Power Traction Company, and the motor omnibuses which this company are building will embody the features he considers necessary for the permanent success of London vehicles. Mr. Stirling's new company, we are advised, propose, also, to introduce a new feature in connection with public service vehicles. They are prepared to undertake a maintenance contract for a period of years on the basis of the mileage run.



The Miller Trophy.—The above is another of the prizes won by Mr. Macdonald on the Napier Car at Ormond-Daytona Beach. This is a Perpetual Challenge Trophy for a 10-mile race, Macdonald securing the Cup in the record time of 6 mins. 15 secs. In addition to the trophies illustrated on this and the opposite page, Mr. Macdonald secured the Bowden Trophy for a standing kilometre (record time, $27\frac{1}{2}$ secs.), and he also won two gold medals and eight certificates.

A Spare Tyre Bag.—One of the latest covers for the protection of spare tyres is that brought out by the Palmer Tyre Company



and illustrated above. It is made of a strip of waterproof material mounted on two steel rings. When packing, the rings are sprung through the tyre from opposite sides, and in such a way that the waterproof cloth is wrapped lightly round the tyre. The steel rings have a diameter equal to the mean diameter of the tyre, so that when they spring into position they serve as a simple and effective fastening which is both neat in appearance and easily detachable.

WHEN success attends a high-class car, whether a racer or a tourist vehicle, the public not unnaturally are desirous of knowing the various accessories which help to contribute to that success. In this respect Mr. A. E. Macdonald has notified the United Motor Industries, Limited, that when he drove the 6-cylinder Napier so successfully in Florida, and lowered a number of world's records, which we have already published, that he used "Castle" accumulators, working a "Castle" coil, both of which he found extremely satisfactory. The latter, in fact, was fitted in the place of another

coil of a well-known make, which Mr. Macdonald states failed utterly.

MR. ALEXANDER MACKENZIE, JUN., manager of the coach-building department of the Motor Traction Company, Kennington (formerly for many years known as "The Mackenzie Carriage Works"), is taking up the position of general representative in the United Kingdom (outside London), of the well-known firm Smith, Parfrey and Company (Pimlico Wheel Works). On account of the number of coachbuilders now entering the motor business, Mr. Mackenzie's long and intimate experience in the coach trade will be a useful connection, and all his old friends will wish him every success in his new sphere.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or parts of their objects.]

Motor Bus Company (Limited).—Capital, £100 in £1 shares.

Motor Omnibus Construction Company (Limited), Basildon House, E.C.—Capital, £10,000 in £1 shares.

New Motor Syndicate (Limited), Basildon House, E.C.—Capital, £5,000 in £1 shares.

Oxford Syndicate (Limited), 794, Salisbury House, London Wall, E.C.—Capital, £1,000 in 1s. shares. Object, to carry on the business of motor car, omnibus proprietors, &c.

Taximeter Motor Cab Company (Limited).—Capital, £100 in £1 shares.

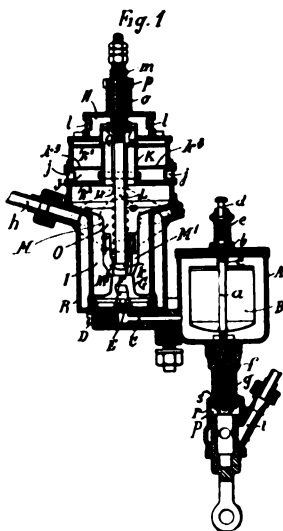
Wilkinson Tyre and Tread Company (Limited).—Capital, £14,000 in £1 shares. Object, to acquire the business of manufacturers of patent tyres and non-slipping wearing treads and coverings carried on by the Wilkinson Tyre and Tread Company (Limited) (in liquidation), at Chapel Hill Mill, Huddersfield. First directors, C. H. Wilkinson, R. D. Dundas, and T. H. Wright.

G. A. Wilson and Co. (Limited), 55, South King Street, Dublin (Irish Company).—Capital, £500 in £1 shares. Object, to establish the business of manufacturers of and dealers in cycles, motors, &c.

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, 232, Strand, W.C.

The first date given is the date of application; the second, at the end, the date of the advertisement of the complete specification.

2176. 28th January, 1905. Improvements relating to Carburettors for Explosion Motors. Société Anonyme des Moteurs et Automobiles Herald, 71, Avenue de la Grande Armée, Paris, France. The object of this invention is a carburettor particularly for motor vehicles adapted to act equally well with either alcohol or petroleum spirit. There are two figures. Fig. 1 is a sectional elevation in a central plane. The reservoir, A, contains the float, B, mounted on a rod, a, the upper part, c, of which has

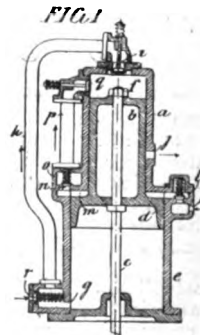


a screw thread on which is screwed the stop, b, for a spring, e, the tension of which is variable by the rod, a. The rod, a, rests on the spindle of a small valve, f, which controls the supply of the fuel. The valve

is kept to its seat by a spring, g, regulated by the nut, r, and the cup, s. The spindle of the valve, f, is made triangular in cross section. The valve, f, opens into the chamber, P, fed by the channel, t. The tank, A, communicates by the channel, C, closed by the plug, D, leading to the channel, E, and the nozzle, F, surrounded by the casing, G, which is open to the air on two sides of the nozzle. The carburettor chamber, I, has a jacket, R, through which the exhaust gases pass through the pipe, K. Above the jacketed portion is the chamber, J, having ports, j, covered with gauze, and above this the chamber, N, having the ports, l, also covered with gauze. In the chamber, j, is the spring-controlled valve, K, formed of two plates, K¹ and K², sliding on a rod, L. The rod, L, terminates in the boss, k, on which the spirit fuel impinges, which is surrounded by the tube, M, carrying screens, M¹, which serve to guide the air entering through the ports, j and l, as near as possible to the boss, k. The rod, L, is screwed into the sleeve, m fitting a screwed socket, o, at the top of the chamber, N, terminating in a disc, n, in the chamber, Q. On the sleeve, m, is the nut, p, which bears on the socket, o, and regulates the sleeve, m. The air enters below and round the nozzle, F, carries off the spirit from the nozzle, and, guided by the casing, G, projects the mixture against the boss, k, and the mixture proceeds to the engine inlet port, O. Further air is added through the ports, j, but when the suction pressure increases owing to the increased speed of the motor the valve, K, descends, so that the top of the chamber, Q, descends below the disc, n, and allows air to enter through the ports, n, so maintaining a mixture of constant composition. The movement of the valve, K, is controlled by the spring, U. K² is a fixed plate. Feb. 22nd, 1905.

2561. 2nd February, 1904. Improvements in Explosion-Engines. H. P. C. Hansen, 2, Copenhagenholms Allé, Frederiksberg, near Copenhagen, Denmark. The object of this invention is to scavenge out the whole of the products of combustion in a one-revolution or two-stroke cycle motor by means of a pump piston made integrally with the working piston. There are seven figures. The working cylinder, a, has a piston, b, with a piston-rod, c. The piston, b, has made with it a piston of larger diameter, d, which moves in the cylinder, e. When the working piston, b, moves downward, by the

working pressure, the piston, d, compresses the air in the cylinder, e. Near the end of the working stroke the exhaust port, f, is uncovered, and immediately following the valve, i, opens by the pressure of the air in the pipe, k, and the compressed



air in the cylinder, e, then flows by the port, g, pipe, h, and valve, i, to the combustion chamber, j, of the working cylinder, driving out the products and filling the space with air. During the downward motion of the piston, fuel in the form of gas or vapour is drawn into the annular space above the piston, d, through the supply pipe, k, and valve, l. By the upward motion of the piston, the fuel is forced through a passage, m, and valve, n, to a receiver, o, and pipe, p. Simultaneously with, or immediately after, the opening of the valve, i, the valve, g, is opened by the pressure of the compressed fuel, so that a part of the compressed fuel flows into the working cylinder, mixes with the air there, and on the compression of the charge is ignited and expanded. During the upward travel of the piston, air is again drawn into the cylinder, e, through the valve, r, and the port, g. The scavenging of the cylinder is thus effected with a considerable excess of pure air. The fuel also, on entry to the cylinder, meets with cooler air instead of products of combustion. Feb. 22nd, 1905.

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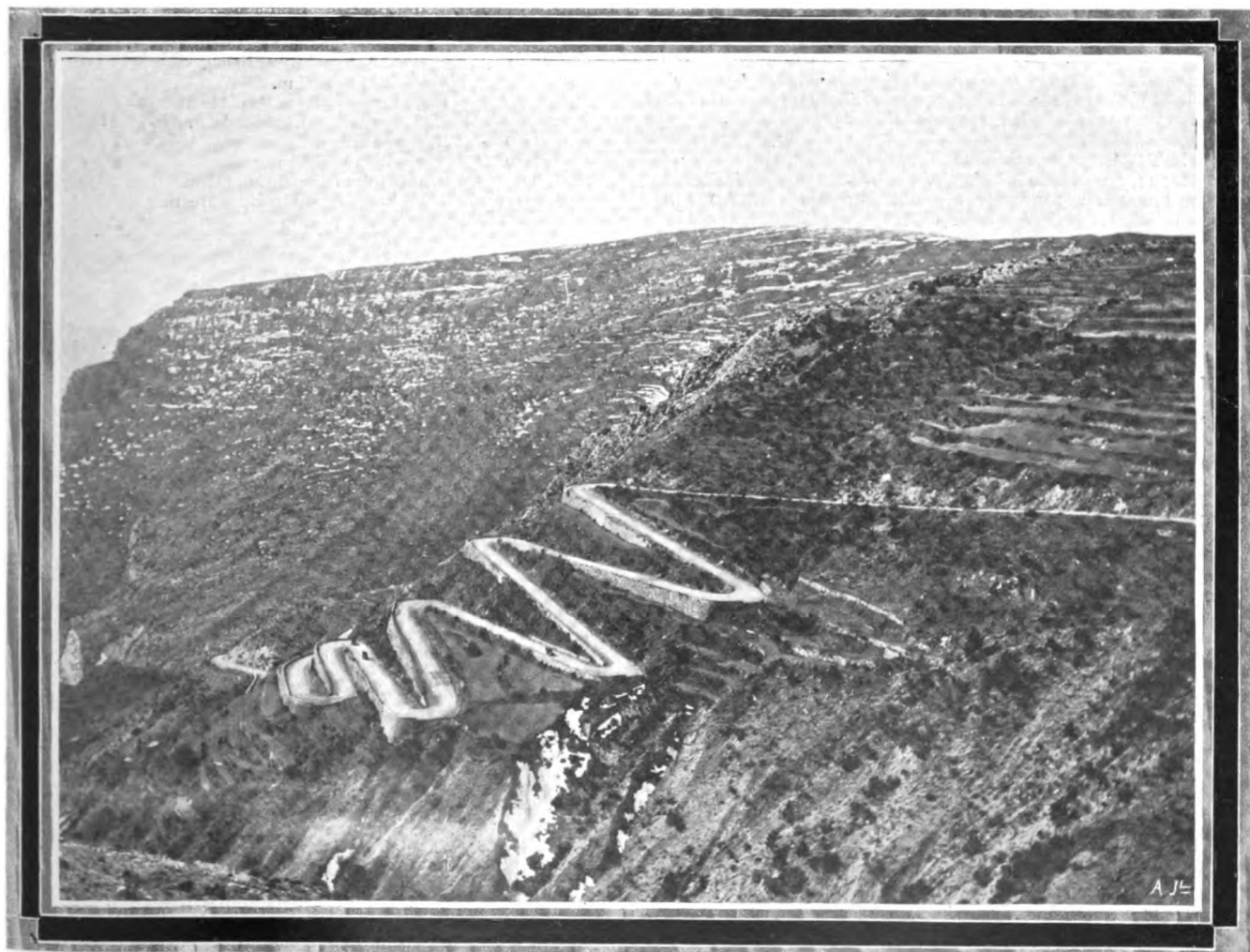
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MARCH 11TH, 1905.

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CANNES AUTOMOBILE WEEK.--After the more serious items of this opening automobile meeting of the season had been concluded, several enjoyable runs were made by the tourist car owners who had taken part in the more formal competitions. One of these was to Sospel, on the spurs of the Maritime Alps, where the first glimpse of Italian soil is obtained. To reach the summit of this mountainous district some gloriously picturesque scenery is traversed, and an idea of the country passed through may be gathered from the view given above, with its unique winding roads, on which the ascending cars of the tourist party have the appearance of flies crawling up the corkscrew-like road.

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DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
Mar. 9 ...	"Non-slipping Treads and Devices for Motor Cars," by Mr. J. D. Siddeley.
Mar. 16 ...	"Future of the Electrical Vehicle," by Mr. T. G. Chambers.
Mar. 18-25 ...	Cordingley & Co.'s Exhibition (Agricultural Hall).
Mar. 21 ...	Motor Van and Wagon Users' Association Dinner.
Mar. 23 ...	"Motor Mountaineering," by Capt. Deasy.
Mar. 25 ...	Motor Cycling Club Brighton Run.
Apl. 29 or May 1 ...	May Day Parade
May 6 ...	Auto Cycle Club Hill Climb.
May 10-13 ...	Scottish A.C. Reliability Trials.
May 12 or 19 ...	*Quarterly 100 Miles Trials.
May 13 ...	Auto Cycle Club Members' Penalty Run.
May 20 ...	200 Miles Trial (Motor Cycling Club).
May 30 ...	*Gordon-Bennett British Eliminating Trials.
May 31 ...	Auto Cycle Trials and "Selection" Race.
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.)
June 10 ...	London-Edinburgh (Motor Cycling Club).
June 24 ...	100 Miles Passenger Trial (Motor Cycling Club).
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 4-5 ...	*Motor Boat Trials (Southampton).
July 8 ...	Auto Cycle Club Consumption Trial.
July 13 ...	*Hill-Climb (Henry Edmunds Trophy).
July 19-22 ...	*Brighton Speed Races.
July 27-28-29 ...	*Blackpool Motor Meeting.
July ...	24 Hours Run (Motor Cycling Club).
Aug. 11 or 18 ...	*Quarterly 100 Miles Trials.
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 19 ...	*Van Trial, Light and Heavy Vehicles.
Aug. 26 ...	Inter-Team Trial (Motor Cycling Club).
Sept. 9 ...	Brown Cup (Motor Cycling Club).
Sept. 12 ...	Auto Cycle Club Race Meeting.
Sept. 14 ...	*Tourist Trophy (Isle of Man).
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).
Sept. 18-Oct. 3 ...	*Reliability Trials.
Oct. 4 ...	*Speed Trials.

* Automobile Club of Great Britain and Ireland Events and Papers.

Nov. ...	Society of Motor Manufacturers and Traders Exhibition at Olympia.
Nov. 10 or 17	*Quarterly 100 Miles Trials.

Foreign Events (Trials, Races, &c.).

1905.	
Mar. 13-18 ...	Boston Exhibition.
Mar. 15-Apl. 9	Copenhagen Exhibition.
Mar. 16-29 ...	Vienna Exhibition.
Mar. 27-Apl. 5	Washington Exhibition.
Apl. 2-16 ...	Monaco Motor Boat Fortnight.
Apl. 14-23 ...	Nice Automobile Week.
Apl. 17 ...	Speed Mile and Kilometre (Nice).
Apl. 18 ...	Coupe de Caters (Nice).
Apl. 20 ...	Coupe Burton (Cannes).
Apl. 20-21 ...	Cannes Motor Boat Meeting.
Apl. 23 ...	Coupe Provinciale (Nice).
May ...	Paris Industrial Vehicles Trials (A.C. France).
May 4-12 ...	Auto Cycle Club de France Tour.
May 11-25 ...	Stockholm Automobile Exhibition.
June 18 ...	International Motor Cycle Cup.
June 26 ...	Mont Cenis Hill Climb.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Calais-Ramsgate (Motor Boats).
July 30 ...	Circuit des Ardennes.
Aug. 6-9 ...	Paris-Trouville (Motor Boats).
Aug. 10 ...	Gaston Menier Cup (Motor Boats).
Aug. 11 ...	Anthony Drexel Cup (Motor Boats).
Aug. 12 ...	International Cup for Motor Boats.
Aug. ...	Herkomer and Bleichroder Races.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Vincenzo-Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.
Sept. ...	Tourist Car Trial (A. C. de France).
Sept. 3-10 ...	Royan Meeting.
Sept. 3-10 ...	Spa Automobile Club.
Sept. 11 ...	British International Cup (Motor Boats Arcachon).
Sept. 12-14 ...	Lake Lucerne Motor Boat Meeting.

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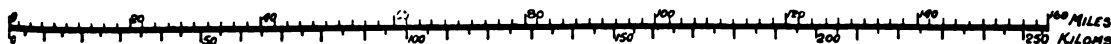


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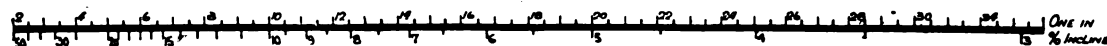
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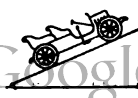
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"One In": Per Cent. Incline.—In England, hills are generally expressed as having a rise of "One in" 10 (say); Continental practice, however, is to express the incline as a percentage thus:—(1 in 10 = "10 %").



PASSING EVENTS.

For the Sake of the British Industry.

WHILE the racing question is exciting acute interest in France, and the situation has been reduced, as we point out elsewhere, to a general muddle, it is well to remind the British automobile public that the arrangements for the most sensible race which has ever been organised or suggested are going steadily forward, that the end of September is fixed for the holding of the event, and that the Isle of Man will in all probability at that date witness the competition for the International Tourist Trophy which has been established by the A.C.G.B.I. We have heard a good deal lately about patriotic endeavours to promote the welfare of the automobile movement in this country. There can be no doubt that to support the Tourist Trophy organised by the Automobile Club will be one of the most effective methods of benefiting home manufacturers. The makers of France may triumph in building monstrosities which career along the road at lightning speed, but the leading British manufacturers of tourist cars now turn out, and have turned out for some considerable time past, vehicles which are the equal in every respect to the best tourist cars which can be made on the Continent. The rules of the Tourist Trophy, which we discussed at considerable length in our issue of December 17th, will ensure that the race is won by a really practical tourist car, and in such a competition we do not think the British manufacturers have anything to fear. It is therefore well that the event will be international in character, and that any other manufacturers, no matter what their nationality, who like to enter into competition with British builders, can do so on equal terms. So far, no attention has been accorded by the club to the suggestions that have been put forward to adopt the principles which we have so much objected to when proposed across the Channel, that is, a proportional representation in favour of the home country. We are glad that this is so, and we trust that the Automobile Club will not deviate from this principle, for it is quite impossible for any people outside the nursery—and we might perhaps add France—to complain of a course of action when adopted by one country and then to go and adopt precisely the same course of action themselves.

As regards the rules, the club authorities themselves recognise fully that they cannot at present be regarded as final. It is, of course, impossible to devise an ideal set of rules for a race of a type that has never been held before, until, at any rate, the event has actually taken place. There can, however, be no question at all that, as a set of rules, they are admirably conceived for their purpose, and are greatly in advance of any other racing rules which have been proposed, either in this country or abroad. This is one of the most satisfactory features connected with the race. It should have the effect of considerably increasing the number of entries, which, to judge from present indications, will undoubtedly be large.

The Gordon-Bennett Embroglio.

WE cannot altogether congratulate our neighbours on the other side of the Channel on the outcome of their efforts to deprive the Gordon-Bennett Cup Race of its unique importance in automobile racing, by means of their Grand Prix and other manoeuvres, for ultimately the attacks have had to be entirely and completely with-

drawn, and now instead of there being practically no Gordon-Bennett, there is no Grand Prix, though *en revanche*, the French club have issued a ukase to the effect that next year the Gordon-Bennett Race is to be knocked on the head. This, as far as we can see, is more than the French club can do. If they win this year, and are challenged next year, they will have to defend the cup (so it would seem) or give it up; while if they lose the race this year they will have no say in the matter. On the whole the situation is rather amusing. The Grand Prix was designed to overshadow and generally to "spifficate" the Gordon-Bennett, and for this purpose it was to have been run on the same day. Against this, as our readers will remember, the foreign clubs kicked, and kicked vigorously. Then, in order to inspire the French club with sufficient vigour, a number of French manufacturers declared that should the club dare to give way on the point, and refuse to run both races at the same time, they would compete in neither. The Gordon-Bennett Commission subsequently met, and compelled the separation of the two events. This, of course, placed the French manufacturers, who had endeavoured to stiffen the back of the French club by the above-described action, in an awkward dilemma. The only way out appeared to be to abandon the Grand Prix altogether. At any rate that is the course that has been taken, and the doubled-barrelled project perishes without regret, we think, from anybody—"unknelled, unconfined, and unsung." The Gordon-Bennett remains, and will be run as an independent event. What with the resolutions passed by certain of the French manufacturers, and other resolutions partly embodying these resolutions, passed by the French club, the determination to do certain things in 1905, and certain quite different things in 1906, the whole racing question in France has been brought into a pretty muddle, and

"He who understands it would be able
To add a chapter to the Tower of Babel."

One result, however, emerges with tolerable clearness, and it is a result for which we are not by any means sorry. It is that, probably, in future only one great race (as distinguished from reliability trials and tourist-car events) will be allowed in France by the Automobile Club, and of it the club will take charge. With this exception, no benefit to the French industry seems to have resulted from the whole campaign, but as the campaign was dictated by the narrowest motives, the resulting fiasco is an event over which few people will feel very greatly moved.

The Increasing Importance of the Motor Boat.

WE have repeatedly insisted that high-speed motor boating is destined to become one of the most important and most fascinating pastimes of the immediate future, and that it will have immense commercial prospects before it, to say nothing of its naval importance as well. The demonstration of the powers of one of the most recent designs of motor boat—the re-built Yarrow-Napier model, "Napier II,"—off Greenwich on Saturday, and the remarks of Mr. Yarrow on that occasion, are a confirmation, and more, of all our predictions in this respect. Here we have a little 40-foot, or rather 12-metre (39'38-foot), boat attaining a speed through the water of 30 miles an hour—a pace which not many destroyers equal, and only a very few exceed; and this enormous speed is attained by a pair of 60-h.p. petrol engines—not, strictly speaking, marine engines—which may be looked upon practically as veterans, since they

have already braved the battle and the breeze of three racing seasons. Since last season, Mr. Yarrow has been experimenting with a variety of different models, and the boat, of which we give a number of illustrations (both of the boat itself and of a model) on another page is the present outcome of all this careful winter work. This is the boat with which the triumphant results obtained were secured. The increased speed attained with the same engines as last year is a proof of what thoughtful design and experiment in the mere lines and proportions of a hull can effect. Needless to say, it is a proof, too, not only of the energy and determination of Mr. Yarrow, and of Messrs. Edge and Napier also, but of his conviction that the internal-combustion engine is *the* power generator for the water vehicle of the future. It has, perhaps, hardly been recognised hitherto by ship-builders what the petrol engine has already been capable of doing, but not the least significant remark made by Mr. Yarrow last Saturday was that, in his opinion, speeds of 45 knots an hour (as against 32 knots to-day) may be deemed possible at no distant date, with boats of 220 feet in length, now that nearly 26 knots has already been attained with a 40-foot boat.

A Splendid Testimonial to it.

THE amount of time, money, and energy which Mr. Yarrow has expended in these experiments is, as we point out, a most convincing proof of his belief in the petrol motor boat, and in the internal-combustion engine as applied to boat propulsion. But he added a further testimonial in the instructive speech which he delivered to his visitors. Without any hesitation, he declared that he was firmly convinced that the Napier engines were as reliable in every respect as any steam engine that he is acquainted with. When a boat-builder of Mr. Yarrow's experience publicly makes a statement of this kind, and when, in addition, he has devoted an immense amount of time and trouble to the design and testing of special designs of hulls, it is a sufficient indication of the importance which the motor boat industry possesses in his eyes. That there are few in a better position to judge will be generally admitted. The same evidence is provided, too, by the enthusiastic way in which the other great firm of torpedo boat and destroyer builders, Messrs. Thornycroft, have taken up the petrol motor boat. Both these facts are of the happiest augury for water automobilism, and it is well for those who are able to indulge in pastimes of the kind that it has been taken up in this way by British manufacturers of such experience and resources, for, as we have on more than one occasion pointed out, there is no better sport or more glorious fun than travelling at high speed on the water. Great things, moreover, are expected of the other Napier racing boats, which, as we mentioned on December 10th last, are nearing completion, and it will be especially interesting to watch their relative performances, in view of the fact that they differ considerably in design both from "Napier II" and from one another.

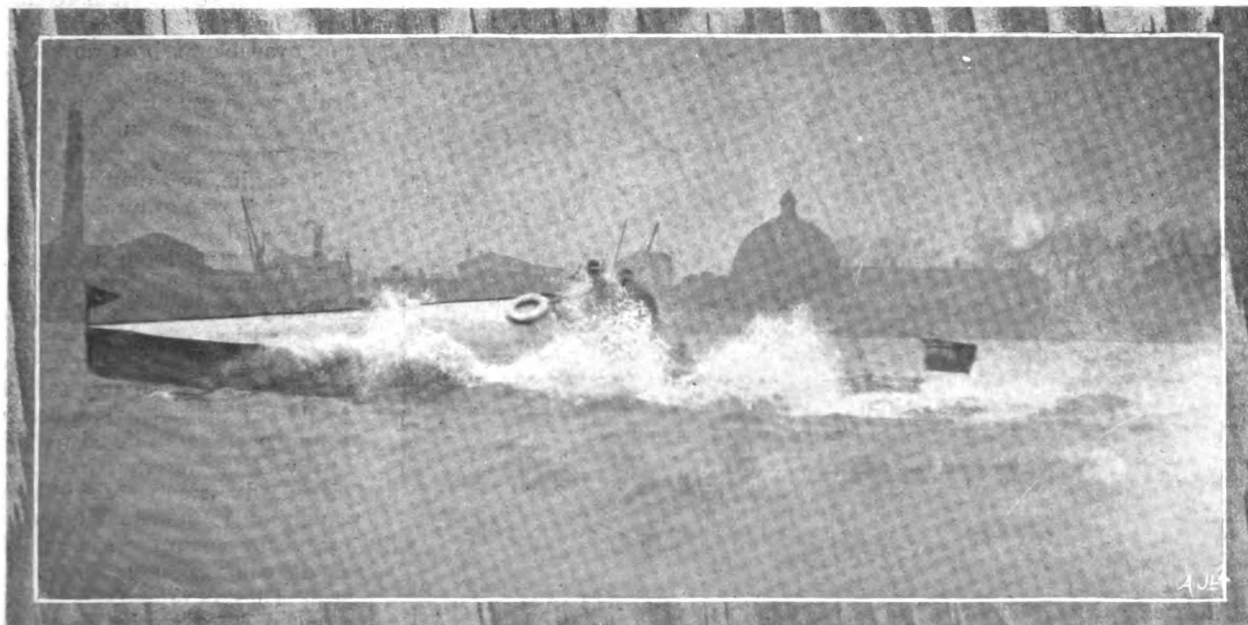
The Motor Car Marines.

THE notion that marines do not figure to advantage on horseback is an old and ingrained one, and at first sight it might be thought that motor car marines would also be a contradiction in terms. This is far from being the case, however, and considerable numbers of the Royal Marine Artillery promise to become expert chauffeurs at an early date. At any rate, they have undergone an examination

on behalf of the Automobile Club by Professor Boys, Mr. R. E. Phillips, and Mr. W. Worby Beaumont, who asked them disconcerting questions about carburettors, electric ignition, the causes of heating in cylinders, and various other matters, and then followed up this written attack by a practical examination on several cars lent for the purpose by several officers who have taken an interest in the class. Fourteen of the Marines went in for this examination, and most of them, we understand, went through it with flying colours, so that they will have every right to make use of the title which we have put at the head of this paragraph. Of course, the idea of the movement is to provide suitable occupation for the men after they have left the service, and the whole class had either completed, or were just about to end, their period of 21 years' service. Motor car driving ought to provide an admirable profession for soldiers on leaving the army, particularly those who have been a long time in service, as they are both likely to be reliable and intelligent. It is often by no means easy for retired service men to find suitable employment. Automobilism seems to offer the very thing for them, and this is particularly the case with artillerymen, whose career has made them familiar with the mechanism of large guns, and the mysteries of electric hoists and range-finders.

Identification Numbers for Hippomobiles.—There seem to be the strongest grounds for extending to horse-drawn vehicles the principle of identification involved in the carrying of a recognisable and easily legible number. The cases have been rare in which automobilists have run over and injured a passenger on the road and made off so as to escape the consequences of the crime. They are by no means rare in the case of the drivers of horse-drawn vehicles, and now we have to report a most scandalous instance which occurred recently in the neighbourhood of Thames Ditton. Two men, named Dean and James, were driving a dog-cart along the Portsmouth Road, near what is known as the Long Arch. They were driving at a considerable pace, and knocked down a woman who was walking peaceably along the road. One of the witnesses, who afterwards gave evidence, declared that she saw the wheel of the trap rise as it passed over the prostrate body of the unfortunate woman. One of the men in the vehicle shouted, "Go on, Bob," to the horse, which then proceeded at a greater rate than before. The unfortunate victim gave one sigh and expired. Ultimately the driver of the trap and its other occupant were run to earth at the Robin Hood public-house, at Kingston Vale, by a mounted constable, but, when told of what had happened, they even then attempted to escape, and made off in the direction of Putney at a high rate of speed, and very nearly circumvented the police. Ultimately, however, they were brought to book, and the Coroner's jury has returned a verdict of manslaughter against them—a verdict which has naturally been followed by the arrest of both the offenders. The offence which we are now describing, having been committed by the drivers of a horse, is escaping with scarcely a comment from the daily Press. We have always maintained that what is sauce for the goose should be sauce for the gander, and the manner in which the two reckless drivers almost succeeded in escaping from the police is sufficient evidence that identification numbers are quite as much required in the case of horse-drawn vehicles as in the case of automobiles.

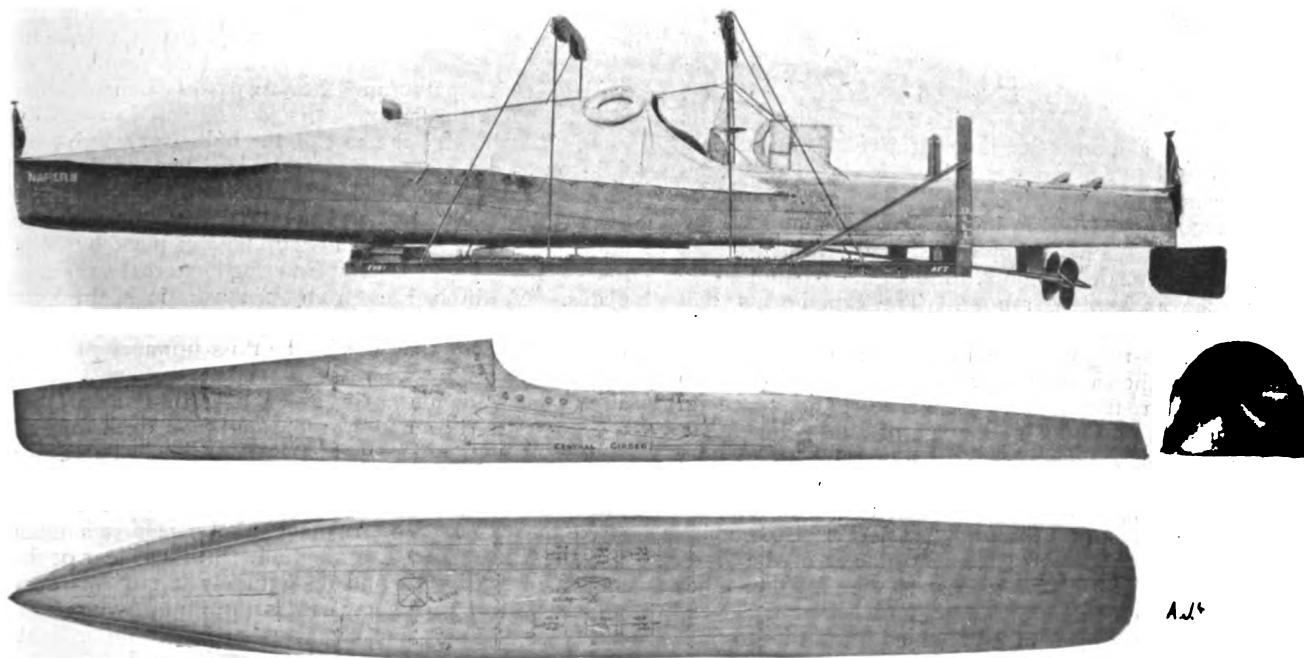
“NAPIER II.”—THE YARROW-NAPIER RACING LAUNCH.



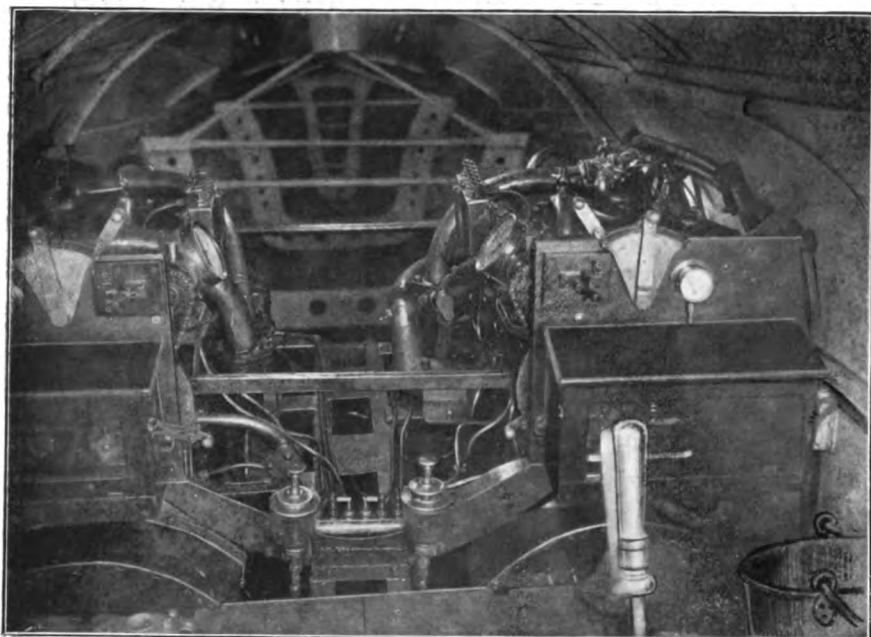
The Yarrow-Napier Racing Launch, “Napier II,” at full speed.

AN extremely interesting demonstration was given on the Thames in the neighbourhood of the famous Yarrow Works, on Saturday last, with the rebuilt racing launch “Napier II.,” which is one of the English boats that has been constructed to take part in the British International Cup Race, and in numerous other important events, this year. On this occasion, Mr. A. F. Yarrow, who has

taken an enormous amount of personal interest in the question, gave some very interesting particulars to the assembled experts and Pressmen, who had been invited to attend, concerning the prolonged and careful series of tests that had been conducted, in order to obtain the desired data for building speed boats of this character. In the course of his remarks, he said that with a 40-ft.



Side view of “Napier II,” lying in her cradle, preparatory to leaving for Monaco; together with three views— from the side, from beneath, and from the stern—of the wooden scale model of this craft.



An interior view of "Napier II," as seen by the "man at the wheel," showing the two 60-h.p. petrol engines, with the central girder between them. This photo also gives a good idea of the roominess of the bows, and of the general internal construction of the hull.

boat fitted with the latest form of steam machinery, or an equally reliable character to the petrol engines actually used, his firm would not be prepared to guarantee a speed of more than 16 knots per hour, whereas the re-modelled boat had, on Monday of last week, been officially timed on the Admiralty measured knot at Long Reach, when a mean speed of 25.988 knots was made, which is equivalent to 29.925 miles per hour. The trial was conducted in the face of "half a gale" of wind, and the times against and with the tide, respectively, were 2 mins. 25 secs. and 2 mins. 12.6 secs. In view of the fact that existing 60-foot torpedo-boats could only make 20 knots, but that a vessel 200 feet in length could run at 30 knots, he considered that such destroyers as those which he had built for the Japanese Government—220 feet in length and having a speed of 31 to 32 knots—might even be made, if fitted with internal combustion engines, to run at a speed of something like 45 knots per hour. The experiments that had been conducted (of which it will be remembered we were able to give some illustrations on April 23rd last) had shown that for speeds of more than 24 knots, a flat plank offered least resistance in comparison with other shapes of hull, but that, since this shape was obviously unsuitable to weather anything in the nature of a rough sea, their endeavours had been to ascertain the form of bow that was most seaworthy, and to select a shape which would not sacrifice the general character of the lines. By selecting a flat-bottomed boat, as they had done, they overcame the tendency that there is for a high-speed boat to sink, because a flat-bottomed boat tries to push the water downwards, instead of merely pushing it out sideways; but since it has no time to shove it down, the boat runs along the surface instead. Mr. Yarrow also paid a very high compliment to Mr. Edge and to Mr. Napier—and less directly also to the automobile industry

generally—for he stated that in his opinion the Napier petrol engines were every bit as reliable as the best steam engines that are now available for boat work, and he mentioned that those which had been in use under his observations had never failed to work even under very trying conditions; they had evidently been quite a surprise to him.

The hull of "Napier II." is now 12 metres long, and has a 5 ft. beam. The bows have a considerably finer entry than they had last year, although the actual nose is stopped off, and is some 2 or 3 ft. shorter than it would be if the sides were allowed to run out to a knife-edge; this relatively useless ram has been dispensed with, in order to keep within the 12 metre limit, and to practically obtain the same result as with a longer boat. The special steel plates, of which she is constructed, are of 18 and 20 gauge, and the main frame-work is longitudinal instead of transverse. The general shape and appearance is well shown in the

accompanying illustrations, some of which were taken from the actual boat just before she left the Yarrow Works for Monaco, others being reproduced from photographs of a wooden model, which was kindly lent to us by the firm.

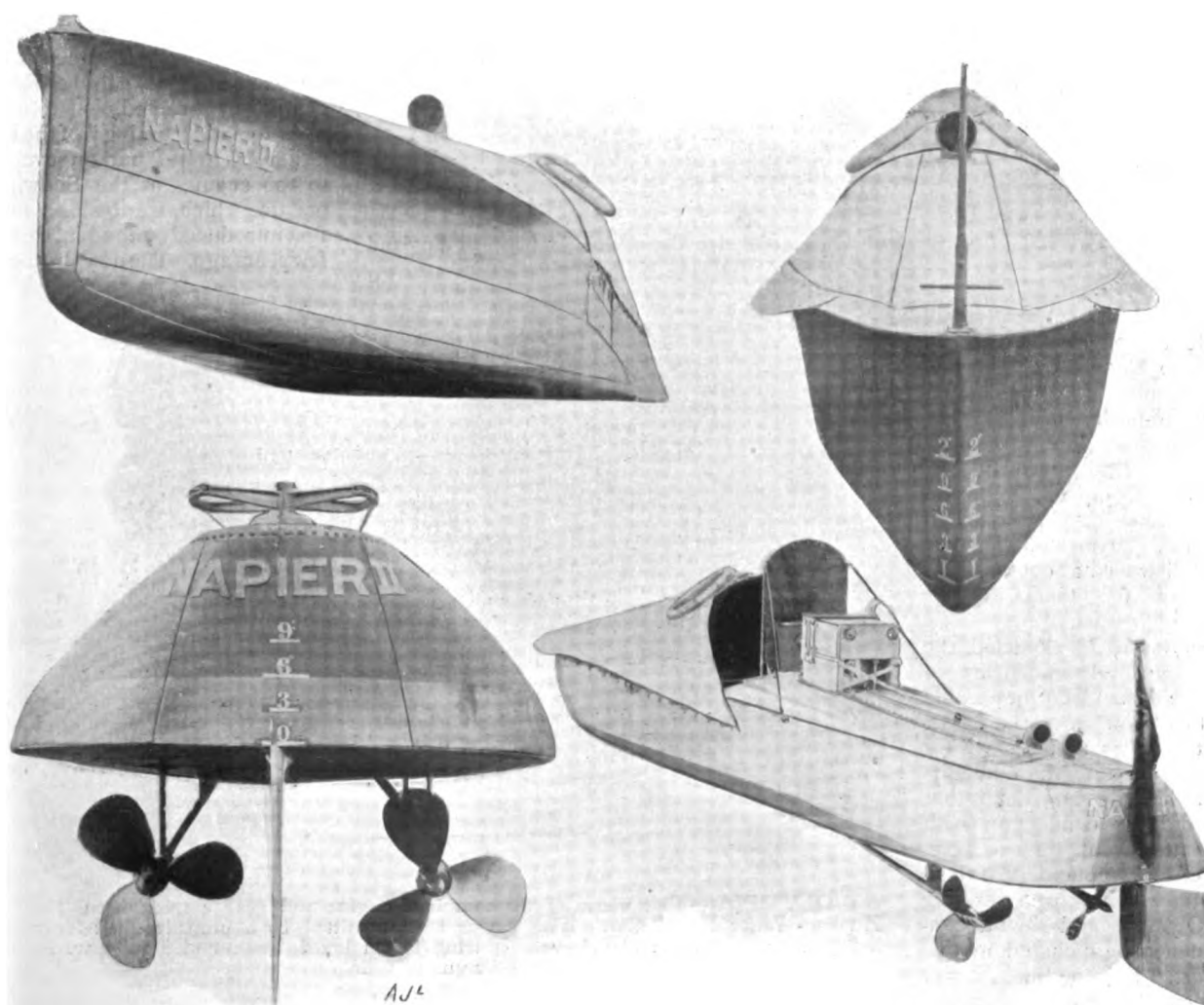
The hull is an extremely striking example of boat building, with longitudinal angle-irons, to which the plates are fixed, with transverse half-bulkheads at intervals, and with tubes and stays across from gunwale to gunwale. The fore foot is constituted by forged steel plates, of which that forming the nose passes a considerable distance along the flat bottom, and is rendered especially rigid, though—like the rest of the hull—very light, by well-considered stiffening plates. The two engines lie side by side, almost amidships, and are supported by a central girder of box construction, while the outer feet are carried upon blocks, which are held in place by bolts that pass through the shell and through external stiffening plates. As will be seen from our illustrations, the boat is flat bottomed from end to end, and is almost exactly like a sledge, in that it slightly runs upwards at both ends. The bows, however, have, as we have already said, a fine entry, and it will be noticed that they are curved over to meet the hurricane deck in such a way that a much greater surface is available for ensuring stability in a heavy sea, and in order to throw outwards the fine spray that is raised when the bows strike the water. When running at full speed in a smooth sea, the first 6 to 10 ft. of the hull stands up clear of the surface of the water, and on Saturday last it was very noticeable that such spray as was thrown up, when running, was of a very fine character, and only quite light. At full speed, moreover, there was very little wash, though naturally a considerable wave is thrown off when the boat settles down to rest, immediately the clutches are thrown out. For still further increasing the "dryness" of the boat, when racing—so far as the occupants are

concerned—metal spray-guards are fitted on either side of the hurricane deck.

The two 4-cylinder engines, which are the same as those used last year, and are, as Mr. Edge remarked, three-year-old motor car engines—and not really marine engines—are capable of giving a little under 60-h.p. each when running at 1,000 revs. per min., but they give their maximum power in the boat at 1,200 revs. per min. The bore and stroke are $6\frac{1}{2}$ in. and 5 in. respectively, and, this year, the eight exhaust pipes are led direct out through the sides of the boat, above the water line. Each engine has its own metal-to-metal cone clutch, and there is a reversing gear introduced between one engine only and its propeller shaft. The slip of the propellers is said to be about 8 per cent only, and they—like many other portions of this interesting craft—have been the subject of a good deal of experiment. The 100-gallon petrol tank is fixed in the stern, and the funnels at the rear, which last year were used for the exhaust, now only act as ventilators.

During our visit to the Yarrow Works, we were also able to inspect—amongst many other interesting things—a 60-ft. steel boat, which the firm have them-

selves equipped with a 4-cylinder Napier engine and reversing gear, and also a very striking shallow-draught steam launch built by them for shallow water work. The petrol boat has proved itself capable of running at over 15 knots per hour, and shows how extremely roomy and easily managed a craft of this kind can be, for the engine only occupies a comparatively small space amidships, and only one man in addition to the helmsman is really needed. The shallow-draught boat, although 75 feet long, and capable of doing its 10 or 11 knots per hour, has a draught of only 11 inches, and the propeller-shaft lies an inch above the water-line. The shaft and the propeller are enclosed in a metal casing that projects above the floor, aft of the 2-cylinder vertical engine, and the propeller runs in a kind of tunnel, from which all the air is immediately excluded by the entering water as soon as it starts working. These boats, as now made, have a horizontal boiler, but it must have been evident to all those who examined this one last week that an internal-combustion engine would in many cases be far preferable to the steam plant, and that the useful field for marine motors is indeed enormous for all parts of the civilised world.



Four views of "Napier II." In the upper two, the shape and construction of the bows is well shown, as also is the arrangement of the spray-guards on either side, while, below, are given corresponding views of the stern, in which the propellers and the rudder are especially prominent.

THE OLYMPIA EXHIBITION OF 1905.

(Continued from page 280.)

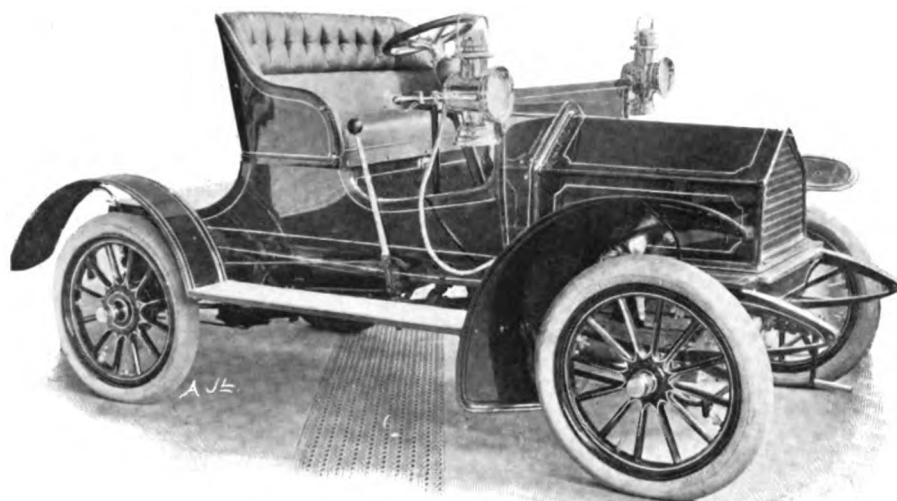
Engines.

ALTHOUGH at the Paris Salon, there were comparatively few 6-cylinder engines, and it was evident that—so far at any rate—Continental manufacturers have failed to recognise sufficient superiority in them to warrant the

by employing interchangeable valves, and by mounting them on opposite sides. In this way, one cam-shaft alone is required, and the surface area of the combustion-chambers is materially reduced. A further step in this direction, and one that enables the inlet-valves to be removed without disturbing the induction-pipe, is to form a passage in the top of the cylinder-casting itself, for leading the explosive mixture across from the opposite side—as is done in the latest Ariel and Ryknield engines.

Another noticeable characteristic of the former engine is that the valves are set at an angle with the cylinder—being in this respect similar to the Daimler—so that the combustion-chamber can have its surface area still further reduced, while, at the same time, the exhaust-valves can be more completely jacketed.

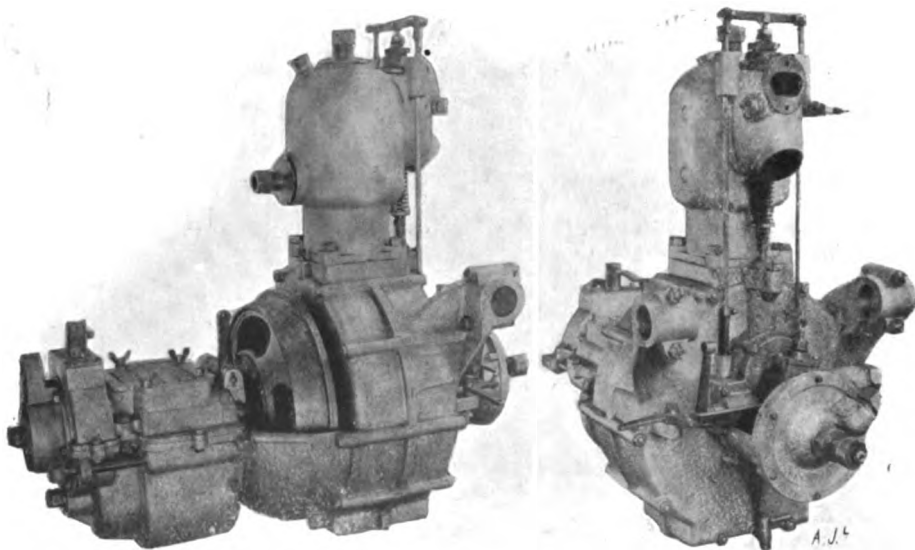
Automatic "timing" of the ignition was to be found on several of the engines at the Show, a practice which, we believe, was first introduced on the Fiat cars a few years ago. The new Brother-



AT OLYMPIA.—The 2-seated Hitchon-Weller Car which is built in England and has a special type of gear combined with the engine.

additional cost, yet, at Olympia quite the opposite may be said to have been the case. The number of English manufacturers who are building such engines seems to show that the lead given by the Napier Company, amongst others, has been appreciated by the buying public, and that there is a considerable demand for them in this country at least.

As was to be expected, the same general tendencies in engine design were noticeable at this show as at the Salon, so that it is unnecessary for us to enter into these in anything like the same detail that we did in connection with the latter event. There were, nevertheless, one or two fresh points which proved striking at Olympia and should consequently be included in this report. For one thing, it was evident that many makers are now inclined to arrange the inlet-valves immediately above the exhaust-valves, and to operate them mechanically from the same cam-shaft, thus deviating from last year's tendency, which was to render the cylinders symmetrical



AT OLYMPIA.—Two views of the combined engine and gear employed on the Hitchon-Weller Petrol Car. The power is transmitted by a propeller-shaft from the gear to the live-axle, and worm-gearing is employed, instead of bevel-gearing, inside the differential casing.

hood car is, it will be remembered, one of the new British vehicles on which it has been adopted, and it appears evident that other makers are also taking it up. Even more noticeable, however, was the absence

of automatic governors for controlling the power and speed of the engines, and, in this respect, the Olympia Show, taken in conjunction with the Paris Salon, appears to indicate that most manufacturers now regard governors as redundant. In the way of rendering the internal parts of petrol engines more accessible, a great deal has been done by the British makers—on much the same lines as on the Continent—by rendering the base of the crank-chamber separately detachable, and by fitting the cam-shafts in such a way that they can be slid out, longitudinally, without taking the engine completely down.

Nothing very striking in the way of radical alterations in design, or in the way of novel principles, was exhibited, the nearest approach being perhaps the "Phoenix" compound engine, and the small "Seal" launch motors, which latter, however, have already been referred to in our columns. The "Phoenix" engine has three cylinders, which are formed by a single casting. The central cylinder is of larger diameter than the other two, and operates upon a crank-pin which is set at 180° from the two other crank-pins. The outer cylinders work alternately (on the usual four-stroke cycle), and they both exhaust into the low-pressure cylinder between them—which is, of course, making its downstroke, while one or other of the two high-pressure cylinders is making its exhaust-stroke. The bore and stroke of the high-pressure cylinders are $3\frac{1}{2}$ ins. and $3\frac{3}{4}$ ins. respectively, and the bore of the low-pressure cylinder is $4\frac{1}{2}$ ins. instead of $3\frac{1}{2}$ ins. One of the little "Seal" engines took part in the Motor Boat Reliability Trials last year, and, although of such small size, behaved extremely well. It has, it will be remembered, a vertical cylinder arranged *beneath* the crank-shaft, and—instead of a cam-shaft—it has a special type of 2-to-1 gear, for operating the exhaust-valve direct from the crank-shaft.

For using heavier fuels than petrol, comparatively few engines were shown, but—apart from the little Seal to which we have just referred, and to one or two other engines which *can* be run with paraffin oil instead of petrol if desired—notable exceptions were the Gardner engines, shown by Messrs. Norris and Henty, and the altered 4-cylinder Panhard in the Hutton boat. The Gardner engines are made in various sizes, but so far these Manchester makers have not attempted to construct paraffin engines for use with self-propelled vehicles—although they are also turning out a lighter form of petrol engine this year—and they have only reduced the weight sufficiently to render them suitable for launch work. In these engines, the paraffin oil is sprayed into a vaporiser by only a small proportion of the entering air, the bulk of the air being allowed to enter direct into the cylinder, some of it being drawn in between the vaporiser and the combustion-chamber, and the remainder through the centre of the cylinder-head. The last mentioned portion of the air-charge is allowed to inject a certain amount of water into the cylinder at full load, the water-feed, which is hand controlled, merely serving to soften the force of the explosions. The vaporiser is only slightly heated by an external lamp, but is so arranged that it derives more and more heat from the combustion-chamber, as the load and the speed increase. By this means, the oil is properly vaporised, and yet is never overheated, although the engine-speed and the load may vary considerably. The engine is governed on the hit-and-miss principle. The Panhard engine in the Hutton boat was equipped with the Chenier and Leon vaporiser, for using naphthalene as fuel, the

apparatus being practically identical with that of which we gave an illustrated description on November 5th last.

Clutches.

In addition to the novelties, in the way of clutches, to which we referred in our Paris report, there were quite a number of new devices on view at Olympia. In connection with cone-clutches of the usual leather-covered type, the Wolseley Company, on their latest pleasure vehicles, have introduced a cushion-spring between the clutch-pedal and the clutch-fork—as mentioned in the special article given by us quite recently describing the new 8-h.p. car—and another arrangement that has much the same object in view was shown by the Simms Manufacturing Company on their new chassis. The Simms device consists of a dashpot that is connected with the clutch-fork in such a way as to prevent the clutch from being brought too suddenly into engagement; it thus ensures a soft starting motion, even should the driver release the clutch-pedal quickly.

The chief novelties, however, were clutches having metal-to-metal friction surfaces, and one or two in which oil is used as a medium for obtaining a hydraulic action, as well as for lubricating the parts. Of the former, those of the multiple-disc type were perhaps most interesting, although many of the visitors were also glad to take the opportunity of examining the Napier cone-clutch, and the single-disc De Dion clutch, that are already familiar to our readers. The clutch employed on the new Ariel chassis is similar to the Napier, being of the metal-to-metal type working in a bath of oil, while the clutch on the new Hermes (Bugatti) vehicle resembles the De Dion and the Rover, inasmuch as it has a single disc; no provision, however, is made in the Bugatti clutch for lubricating the friction faces.

Of the multiple-disc models, the new Bradley clutch—of which we give a full description this week—is, perhaps, the most interesting, since it has a positive mechanism for separating the discs whenever the clutch is disengaged. In this respect it differs from those of the Hele-Shaw type, employed on the Thornycroft and the Argyll vehicles, in which the discs are provided with small springs to perform this duty. The clutch on the Itala car—for which the Fabry Motor Company have the English agency—resembles the new Panhard multiple-disc type, in that no means whatever are provided for actually separating the discs. In it, there are twenty discs on each of the two members, and these overlap one another by over two inches, while triangular slots are cut right through them for retaining a certain amount of oil.

The clutches, in which a hydraulic action is obtained, with an oil medium, were the "Sparks-Boothby" and the "Octopus." The former is made, and is operated, like an internal-cone-clutch, but has metal friction surfaces, and the internal member forms a kind of pump, that begins to act when the clutch-pedal is released, and then forces oil behind the cone, so that the cone is pressed up tightly against the outer member. The pump is constituted by radial vanes, that are caused to slide in and out by a cam on the driving-shaft, and by a stationary vane fixed to the outer clutch-member; these vanes lie in a large annular recess in the face of the inner cone, and thus there are only two narrow friction faces left on either side of them. The idea is that the clutch-spring merely brings the cone faces together sufficiently to form an oil-tight joint between them, and that the hydraulic



AT OLYMPIA.—The 5-h.p. Minervette, which has a two-speed and reverse-gear combined with the engine, has a chain-driven clutch and has a second chain that drives the live-axle.

action then begins, continuing until the driven and the driving members revolve together, and so prevent the pump from having any further effect.

The "Octopus" clutch has four radially placed pump-cylinders fixed to the "driven" shaft, and the four pump-plungers, which carry small rollers at their extreme ends, project outwardly from them. This "driven" portion lies inside the flywheel, the inner face of the rim of which is bored out eccentric to the shaft. Inside the rim is fitted a hardened steel ring, and the rollers on the plungers press up against its inner face. The driving member of the clutch—the flywheel, and its eccentric ring—in this way tend to cause the plungers to reciprocate in their cylinders, when the engine is running, and when the driven member is at rest. The pump cylinders are all filled completely with oil, and are in open communication with one another so long as the clutch-pedal is depressed, the oil then being transferred from one cylinder to another, with the result that those plungers which are being forced inward cause the other plungers to travel outward. Fitted in conjunction with the clutch-pedal, so as to be controlled by it, are four valves which can be made to prevent the oil from being forced out of the four cylinders. These valves are allowed to close when the clutch-pedal is released, and the oil then prevents the plungers from moving inwards, consequently forming a lock between the driving and the driven members.

Change-Speed-Gears.

One of the few entirely new arrangements of change-speed-gearing that was on view, at the Show, was the mechanism that has been adopted by the Brush Engineering Company for the petrol motor buses, of which they have now taken up the manufacture. Two views of the gear were given by us last week. It has three expanding clutches mounted immediately behind the gear-box, about the "driven" shaft, and the external members of these clutches are, respectively, connected with the "driving" shaft, and with two inde-

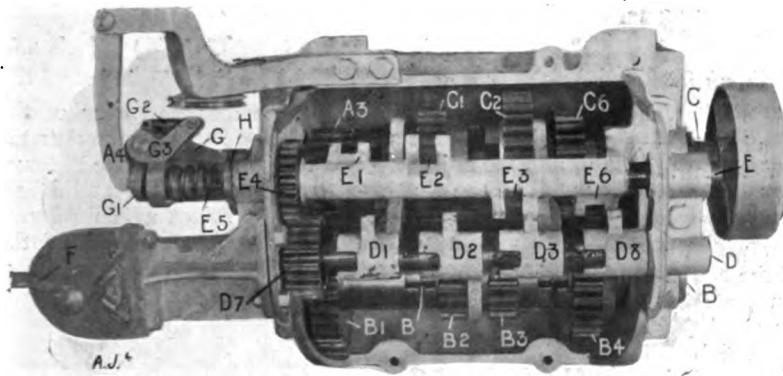
pendent spur-wheels of different size, that lie inside the gear-box. Either of the clutches can be brought into engagement, alternatively, to give the three forward speeds, the top speed being a direct-through-drive, and the two lower speeds being obtained through gear-wheels on a lay-shaft; the gear-wheels remain in mesh with their corresponding wheels on the through-shaft. This gear has been adopted for commercial vehicle work, owing to the fact that no special skill is required to manipulate it.

It is in this respect like the "Soames" gear, which was not only again shown this year by the Langdon-Davies Motor Company, but was also in evidence—both on pleasure and on commercial vehicles—in other parts of the exhibition. The Soames gear is practically the same as it was when described by us on February 20th last year, but a safety lock has now been added to prevent the jaw-clutches, which bring the required trains of gear-wheels into operation, from being moved, until after the main-clutch-pedal has been released. The gear is made in very compact forms, either for live-axle or for chain-driven cars. An illustration showing the new locking device is given this week, the reference letters corresponding—as far as possible—with those that accompanied our previous description. All the gear-wheels remain, it will be remembered, permanently in mesh, and alternative jaw-clutches are used to lock the required wheels to their respective shafts. Either jaw-clutch is now held positively in place by the catch, G, which is carried by the clip, G², and is controlled by the spring, G³. When the clutch-pedal is depressed, the lever, A⁴, pushes forward the arm, G¹, thus raising the catch, G, from the collar, H, and allowing the shaft, E, to slide longitudinally, for the purpose of changing gear.

One of the few gradually-variable change-speed-gears that have survived the severe tests of time is the Newman



AT OLYMPIA.—The 4-h.p. Orient Buckboard, which has the engine and gear mounted behind the back-axle, and is fitted with wire-spoke wheels.



AT OLYMPIA.—The Soames Change-Speed-Gear, showing the locking device, G, which has now been embodied in order to hold each "speed" positively in gear.

gear, which is now manufactured by the well-known firm of electrical engineers, Messrs. Johnson and Phillips, of Charlton. A description of this carefully developed, and ingeniously designed, mechanism was given by us in very full detail in September and October, 1903. Although now made in a commercial form for any type of car, as well as for other than automobile purposes, the principles of its design remain quite unchanged, and a gradual change of gear from zero to maximum can be obtained, which for heavy vehicle work, in particular, is likely to prove of immense advantage.

Ignition Devices.

In addition to high-tension magnetos of those particular types which have already been dealt with at length in our special series of articles dealing with this subject, one or two other makes were to be seen at the Show. These include the new "Castle" type, which is sold by the United Motor Industries, and the high-tension magneto that is fitted on the latest Winton cars. More novel, however, were the types of magnetic

igniters, which, although by no means new in themselves, have been receiving a good deal of attention from manufacturers during the past few months. In them, the intensity coil, needed for the low-tension system, forms a part of the actual igniter itself, and is used for automatically breaking the circuit between the spark points. It magnetises an iron core, which acts upon the moving part. The "Simplex" plug, which is made by the Kennedy Motor Company, and is being sold in London by Messrs. Mann and Overton, is one of these. The United Motor Industries exhibited another apparatus of a similar character, and a third was shown by the Hitchon Gear Automobile Company.

Speed Indicators.

Quite a large number of these useful little instruments, for enabling the driver of a car to see at a glance the speed at which he is travelling, were exhibited on various stands in the Exhibition. Most of them have already been dealt with at some length by us, and we hope to be able to describe the remainder in a similar manner shortly. Mention, however, might be made of those which came more prominently before our notice at Olympia, and the following brief references to the underlying principles in each case may be found useful:—

The instrument made by the well-known watchmakers, Messrs. Smith and Son, is of the centrifugal-governor type, and has a special arrangement of three springs to ensure a very open scale on the dial; the Cowey apparatus, shown by the London and Parisian Company (Capt. Corbet), has a ratchet and pawl device acting on a flywheel; the Davis instrument, in which a rubber diaphragm acts by suction on a column of water in the indicating gauge glass, was exhibited on the Wolseley stall, and the Autometer, which has a magnetic mechanism, was shown on the stall of Messrs. J. E. Hutton.

(To be concluded next week.)



AFTER THE CLOSE OF THE OLYMPIA EXHIBITION.—Hippomobile conveyances waiting for their mechanical freights.

THE 20-H.P. BROTHERHOOD

PETROL CAR.—PART VI.

The Main Clutch.

OF the ordinary cone type, the main-clutch has its inner member cast in aluminium, and there are springs introduced between this portion and the leather friction-face to avoid any tendency to "fierceness," when starting the car. This portion of the mechanism, together with the short square shaft on which it slides, and the clutch-spring, are shown in Fig. 25, where it will be noticed that the clutch-shaft, D¹, has adjustment nuts for regulating the strength of the spring, and that it is connected by a universal joint with the flange-coupling, D², by which it is bolted to the first-motion-shaft of the change-speed-

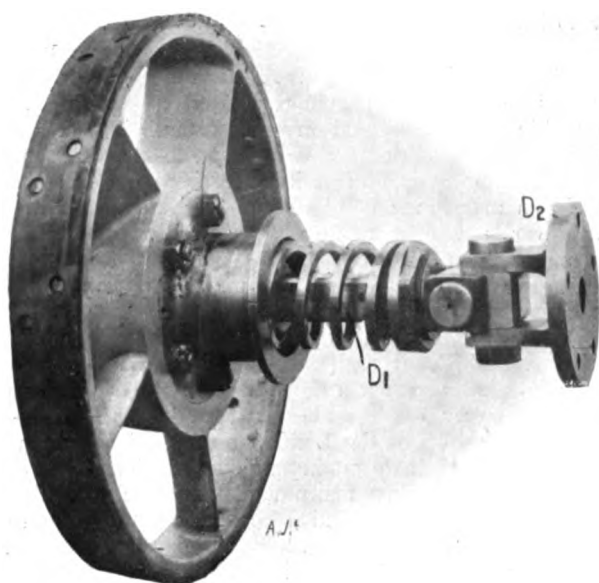


FIG. 25.—The Brotherhood Main Clutch. View of the Inner Cone-member, showing its Fan-blades, the Clutch-spring, and the Universal-joint with its Coupling-flange.

gear. In Fig. 26, which is a sectional drawing, the arrangement of the clutch-fork, D³, and of the combined clutch- and brake-pedal, D, is indicated. The clutch-fork is pivoted on a separate fulcrum-pin, D⁴, and, at its upper end, it is fitted with an adjustable roller, D⁵, which is operated by the cam, D⁶. The cam, D⁶, is mounted on the shaft to which the pedal, D, is fixed. The

adjustment of the roller, D⁵, enables any wear of the clutch-leather that may take place to be compensated for, and the adjustment of the spring allows the pressure exerted on the clutch-cone to be increased or diminished.

The square shaft, D¹, has a spigot at its forward end, this taking a bearing inside the rear end of the crank-shaft, and it will be noticed that the universal-joint near the coupling-flange, D², is made in such a way that the removal of one bolt, only, permits either the clutch or the gear-box to be removed separately. The end-thrust imposed by the clutch is taken by one ball-bearing

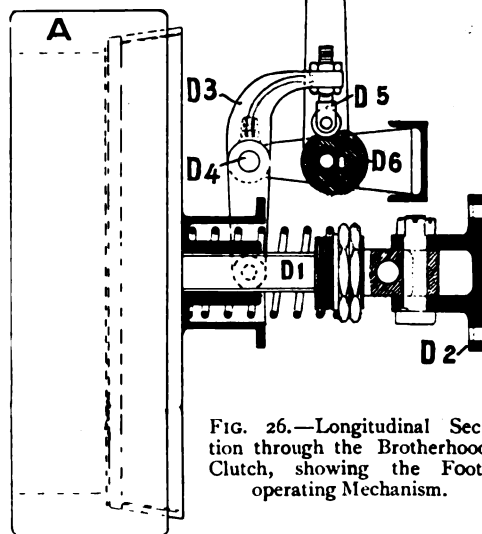
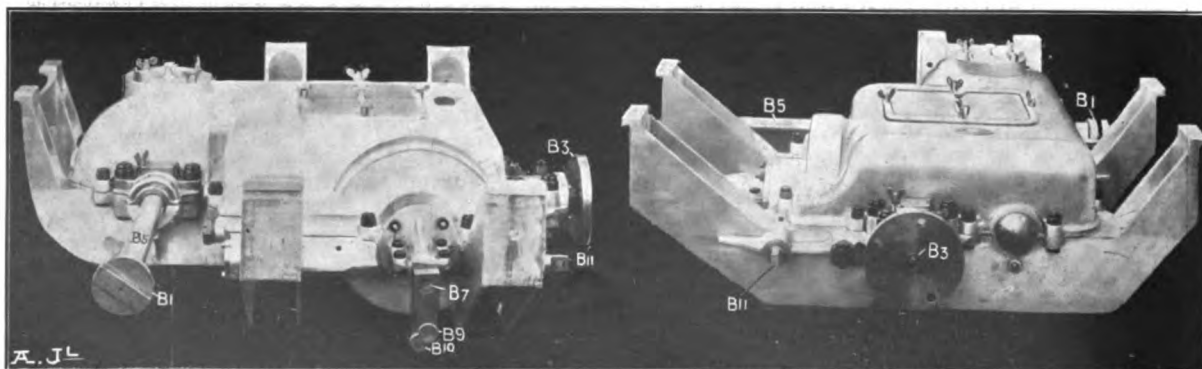


FIG. 26.—Longitudinal Section through the Brotherhood Clutch, showing the Foot-operating Mechanism.

between the flywheel and the crank-chamber, and by a corresponding ball-bearing on the first-motion-shaft. The shape of the cam, D⁶, is such that the clutch is withdrawn as soon as the foot-pedal, D, is depressed slightly, but that the cam merely holds it out of engagement when the pedal is still further depressed. The shaft to which the pedal, D, is fixed, is hollow, and through it passes



FIGS. 27 AND 28.—The Brotherhood Change-speed-gear, showing the complete Gear-box from the Right Side, and from in Front.

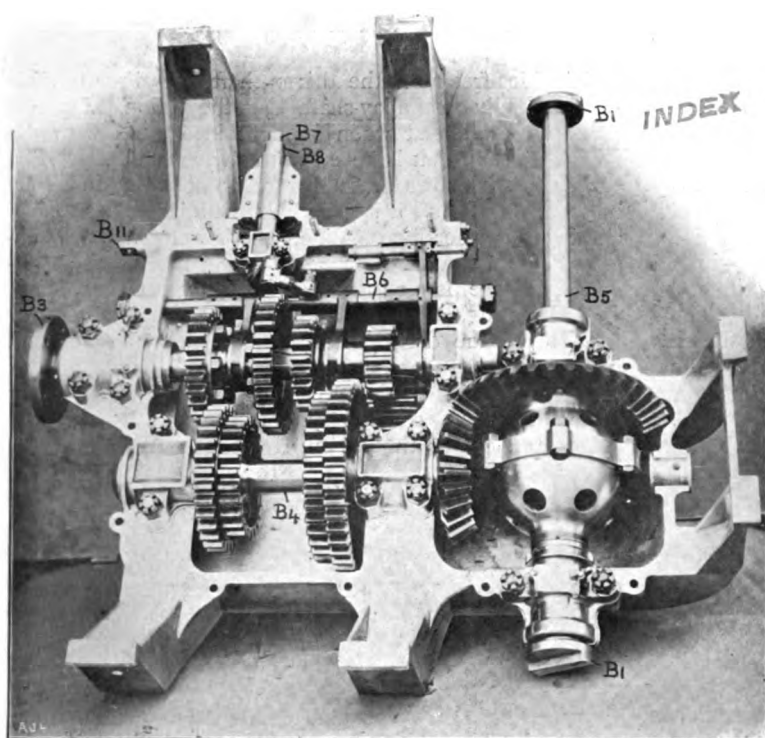


FIG. 29.—The Gear-box, with the Upper Portion removed to show the Interior Mechanism.

the compensating cable that operates the brakes on the ends of the countershaft.

The Change-Speed-Gear.

The three views that we give of the gear-box, in Figs. 27, 28, and 29, are to a large extent self-explanatory, and it will be recognised that the general design is based upon the well-known Mercedes model. The first and second-motion-shafts, B³ and B⁴, as also the differential-countershaft, B⁵, are provided with plain bearings, which are rendered self-oiling, instead of with ball-bearings, and balls are only used for taking such end-thrusts as there are. A special feature of the box itself is that it not only has easily detachable inspection-covers, but that the entire upper half can be removed without disturbing the bearings. The bearing-caps are, to this end, separately bolted down to the lower aluminium casting, and it will be seen that three out of the six main bearings are ring-lubricated, while the other three are completely

enclosed, and receive a constant feed of oil through wire-gauze strainers in the caps.

The three sliding members—the two sleeves on the square first-motion-shaft, and the intermediate “reverse” pinion—are controlled by the three forks mounted on the rod, B⁶. The sleeves for the “first” and “second,” and for the “third” and “fourth” speeds, respectively, are caused to slide by the inner rock-shaft, B⁷, and by the hollow shaft, B⁸, the former being carried inside the latter, and both passing through the side of the gear-box. The shafts, B⁷ and B⁸, are fitted at their outer ends with the lever-arms, B⁹ and B¹⁰—seen in Fig. 27—and they are independently controlled by two rods that are connected with the change-speed-lever. The “reverse” pinion is caused to slide by the rod, B¹¹, which projects forward, as seen in all three illustrations, and this, too, is operated by the same change-speed-lever—as will be explained presently. By the construction adopted, either of the shafts in the gear-box can be removed separately, and any part of the mechanism can be got at without removing the entire gear-box, while a further advantage is that either speed can be brought into play immediately, without having to introduce

intermediate speeds in order to do so. All the wheels are of large size—especially the bevels—and, instead of being merely case-hardened, they are all rendered extremely tough by a special process.

The end portions of the countershaft, which carry the sprocket-wheels and the brake-drums, are carried by long plain bearings of the ring-lubricated type, these being securely bolted to the side members of the frame. The flexible jaw-couplings, B¹, allow for any relative motion that there may be, between the gear-box and these outside bearings—in consequence of any “springing” of the frame—and thus the countershaft is rendered free from lateral strains; the couplings also render the gear-box independent of the sprocket-shafts, should it be necessary to remove either separately. On the maker’s “A” model the side-chains, which are of the roller type, have an $1\frac{1}{4}$ -inch pitch, and on the “B” and “C” models $1\frac{1}{2}$ -inch pitch chains are used.

(To be continued.)



THE AMSTERDAM AUTOMOBILE EXHIBITION.

ALTHOUGH the Automobile Exhibition, which was in full swing at Amsterdam last week, naturally cannot be compared, from the point of view of size, with any of the big international shows, yet it has no doubt fulfilled its purpose, and was to a great extent representative of the Continental manufacturers. About 54 vehicles and chassis, in all, were shown on the 21 stands devoted to manufacturers of cars or their agents, and of these about 70 per cent. were of French origin. They included 36 petrol cars, 13 petrol chassis, 1 steam car, 2 steam chassis—of which one was the “White”—and 2 electric vehicles. By far the greatest number of exhibits, however, were cycles and motor cycles, while heavy vehicles were conspicuous by their absence, and there were comparatively few

motor boats. The only heavy vehicle that we noticed was a Gladiator petrol lorry. Of the six boats, three were American, one was a Spyker, and the other two had no motors fixed in them. No English vehicles of any kind were on view, but the Thornycroft Company showed one of their twin-cylinder launch motors, and were thus about the only English firm that was this year represented.

Of the American cars, too, the White steam chassis above referred to was the only example. The petrol cars included those of the Mercedes Company, Panhard-Levassor, De Dion, Renault, Georges-Richard, Delahaye, Gladiator, Fiat, C.G.V., Darracq, Clement, Chenard-Walcker, and Durkopp.

THE 16-H.P. ALBION CAR.—PART IV.

The Spring Drive.

BETWEEN the clutch and the gear-box is a spring drive, to minimise the effect of sudden shocks, which might otherwise be transmitted unchecked to the gear-wheels. The spring-drive device is seen to the left of Fig. 11, and consists, it will be seen, of four helical compression-springs, arranged as a coupling between the two shafts. The end of the clutch-shaft terminates in a cross-beam, G, which forms two driving-arms; on the end of each is a crank-pin, G¹, carrying a link, G². The links, G², pass freely through trunnions, G³, carried at the ends of another cross-beam, G⁴, which is keyed to the driving gear-shaft. On either side of the trunnions, G³, are helical compression-springs, G⁵, carried by the links, G², so that they form a flexible connection between the

which rides freely on the driven-shaft, N. Free to slide longitudinally on the lay-shaft, L, is the pinion, L³, which gives the low speed when brought into mesh with the gear-wheel, N¹, that is keyed to the driven-shaft, N. The gear-wheel, N, however, is also free to slide longitudinally on its shaft, N, and it is provided with jaw-clutches, N² and N³, on either face. When the jaw-clutch, N³, is engaged with a similar clutch, N⁵, on the face of the spur-wheel, N⁴, the power is transmitted through the lay-shaft, L, and through these jaw-clutches, N³ and N⁵, to the driving-shaft, N; this gives the second speed. The top speed is obtained by engaging the jaw-clutch, N², with another jaw-clutch, K², on the face of the pinion, K¹; the

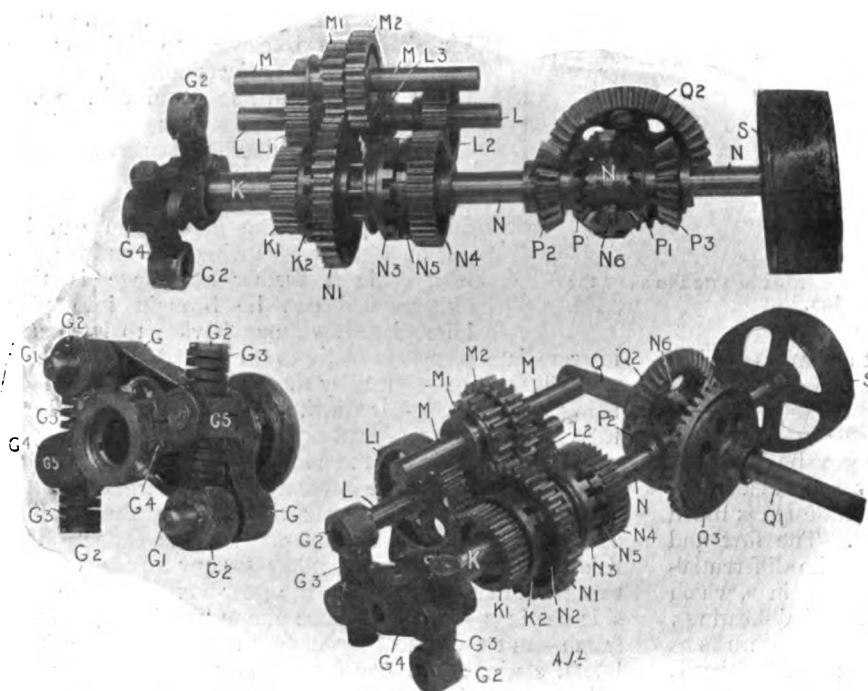


Fig. 11.—Two views of the Albion Change-Speed-Gear and Differential, removed from the gear-box. Also, on the left, a larger view of the Spring Drive, which is shown in position in the other two views of the gear.

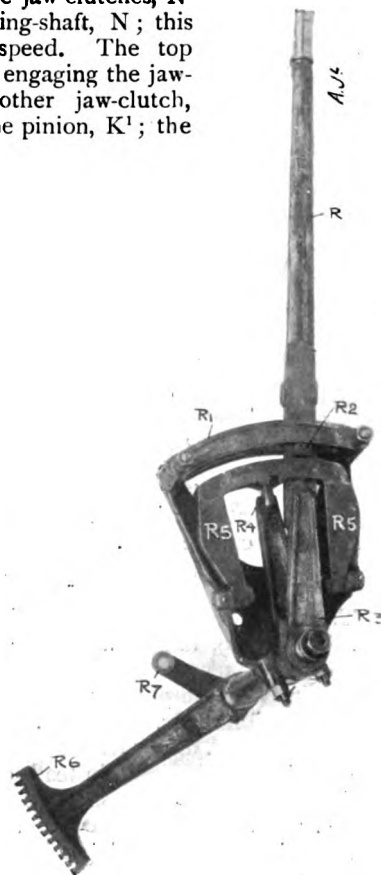


Fig. 12.—The Albion Change-Speed Lever.

member that is attached to the clutch-shaft and the other member, which is fixed to the gear-shaft. Only two of the four springs come into play in the "forward" direction, the other two being used in the "reverse."

The Change-Speed-Gear.

Two separate views of the entire change-speed mechanism—removed from the gear-box—are shown in Fig. 11, and in both these the differential, which is arranged on the longitudinal-shaft, can also be seen. The driving-shaft, K, is connected to the clutch-shaft through the spring-drive, already described, and, in line with the driving-shaft, is the driven-shaft, N, to which a direct drive is obtained on the top speed. The driving-shaft, K, carries a fixed pinion, K¹, which is always in mesh with a spur-wheel, L¹, fixed to the lay-shaft, L. Keyed to the other end of the lay-shaft, L, is a pinion, L²; this pinion is always in mesh with a spur-wheel, N¹,

power is then transmitted direct from the driving-shaft, K, to the driven-shaft, N, the lay-shaft and the wheel, N¹, running idly. To obtain the "reverse," use is made of two spur-pinions, M¹ and M², which ride on a fixed lay-shaft, M. These pinions, M¹ and M², are caused to engage respectively with the wheels, N¹ and L³, so that the power is transmitted from the driving-shaft to the lay-shaft, L, then to the driven-shaft, N¹, through the idle-pinion, M² and M¹, and the spur-wheel, N¹.

These changes of speed are effected by a lever, R (Fig. 12), which works in an "H" quadrant, R¹, and engages either of the short levers, R³ or R⁴, according as to which of the two parallel slots in the quadrant the lever, R, is in at the time. When either of these two shorter levers is engaged by the lever, R, the other is automatically locked in its new position by a double quadrant, R⁵, which is rocked over sideways so that either one of two notches, cut in its under edges,

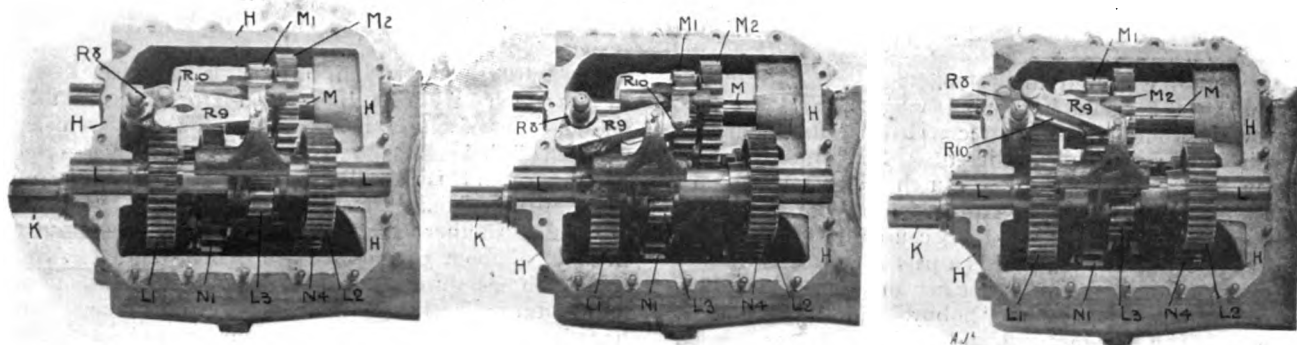


Fig. 13.—Three views of the Change-Speed-Gear, showing the neutral, low speed, and "reverse" positions.

engages with the lever which is not in use. The lever, R^4 , is connected to the arm, R^7 , and a simple interconnection with the sliding member, N^1 , in the gear-box, enables it to give the second and third speeds. The low speed and "reverse" are obtained from the lever, R^3 , which is connected to the toothed quadrant, R^6 , which engages with a pinion on one end of a separate operating spindle in the gear-box. The other end of this spindle, seen in Fig. 12, is fitted with a bell-crank lever, R^8 , which operates two links, R^9 and R^{10} . These links, R^9 and R^{10} , move the sliding pinions on the lay-shafts, L and M, respectively, and thus give the low and "reverse" speeds. The combined action of the two links, R^9 and R^{10} , is clearly shown in Fig. 13, which gives three views of the two lay-shafts, L and M, in place in the gear-box, H. The left-hand view shows the sliding pinions, on these shafts, in their neutral positions. The centre view shows the low speed position, which is given by the pinion, L^3 , meshing with the spur-wheel, N^1 . In the right-hand view, the pinions, L^3 and M^2 , are in mesh, and the pinion, M^1 , is engaged with the spur-wheel, N^1 , to give the "reverse."

The differential is, as has already been mentioned, on the longitudinal shaft, instead of being on the transverse countershaft, as is the usual practice. The differential bevel pinions, N^6 (Fig. 11), are, therefore, mounted on the gear shaft, N, and drive two other bevel pinions, P and P^1 , which ride freely on the same shaft. Solid with the bevel pinions, P and P^1 , respectively, are the bevel pinions, P^2 and P^3 , which engage with the bevel wheels, Q^2 and Q^3 , respectively. The bevel wheels, Q^2 and Q^3 , form the ends of the transverse countershafts, Q and Q^1 , respectively, and as the bevel wheels are of the same size, the two shafts, Q and Q^1 , have to be out of line to prevent the bevel wheels, Q^2 and Q^3 , fouling the bevel pinions, P^3 and P^2 . This difficulty might, of course, be overcome by making one pair of intermeshing bevel wheels of larger size, while retaining the same ratio of gear, but Mr. Murray prefers the arrangement adopted, as the consequent difference in

the length of the two side chains, is only a matter of one or two links. One of the objects aimed at, by this arrangement of the differential, is to balance the end thrusts of the bevel pinions, and there is the advantage that any twisting of the frame does not strain the differential gear itself, although in the Albion car this is further provided against by the casing of the differential being extended around the countershaft as far as the side members of the frame.

The Brakes.

Three brakes are provided—two on the hubs—which are operated from a hand-lever—and one behind the differential case on the end of the longitudinal shaft, this being controlled by a foot-pedal. The foot-brake drum, S, is shown in Fig. 9. The hand operated brakes are compensated by the arrangement of levers shown in Fig. 14.

Table of Reference Letters for the 16-h.p. Albion Petrol Car Illustrations.

A	Carburettor.	M ²	Pinion to mesh with L ³ .
A ¹	Jet.	N	Driven shaft.
A ²	Main air inlet.	N ¹	"First" and "reverse" gear-wheel.
A ³	Induction pipe.	N ²	Jaw coupling on N ⁴ to give direct drive.
A ⁴	Throttle-valve.	N ³	Jaw coupling bolted to N ¹ to give second speed.
A ⁵	Throttle-lever.	N ⁴	Pinion running free on N.
A ⁶	Auxiliary air port, controlled by the governor.	N ⁵	Jaw coupling on N ⁴ to give second speed.
A ⁷	Lever operating A ⁶ .	N ⁶	Differential pinions driven by N.
A ⁸	Auxiliary air port, controlled by the throttle-valve.	P and P ¹	Bevel wheels driven by N ⁶ .
A ⁹	Water jacket.	P ²	Bevel wheel on P.
B	Governor balls.	P ³	Bevel wheel on P ¹ .
B ¹	Governor case.	Q and Q ¹	Transverse countershafts.
B ²	Governor lever.	Q ²	Bevel on Q driven by P ² .
B ³	Fulcrum for B ² .	Q ³	Bevel on Q ¹ driven by P ³ .
C	Control lever.	R	Change-speed-lever.
C ¹	Lever operated by C.	R ¹	Quadrant with double slots.
C ²	Link connecting C ¹ and B ² .	R ²	Catch bolt on K.
C ³	Low-tension igniters.	R ³	"First" and "reverse" speeds lever.
D	Push rods.	R ⁴	"Second" and "third" speeds lever.
D ¹	Tubes enclosing D ¹ .	R ⁵	Rocking quadrant locking R ³ or R ⁴ .
D ²	Timing lever.	R ⁶	Quadrant operated by R ³ .
D ³	Link interconnecting the timing levers, D ² .	R ⁷	Lever arm operated by R ⁴ .
D ⁴	Link connecting D ³ to B ² .	R ⁸	Bell-crank-lever in gear-box.
D ⁵	Spider carrying magnets.	R ⁹	Link operating "low-speed" gear-wheel, L ³ .
D ⁶	Magnets.	R ¹⁰	Link operating "reverse" gear-wheel, M ¹ , M ² .
D ⁷	Magnet pole pieces.	S	Brake-drum on N.
D ⁸	Spider carrying armature.	T	Clutch (outer member).
D ⁹	Armature core.	T ¹	End of crank-shaft.
D ¹⁰	Armature coil.	T ²	Inner clutch-member.
D ¹¹	Circulating pump.	T ³	Sleeve carrying T ² .
G	Driving arms secured to clutch-shaft.	T ⁴	Clutch-bolt.
G ¹	Crank-pins on G.	T ⁵	Adjustment nut on T ⁴ .
G ²	Links pivoted on G ¹ .	T ⁶	Clutch-spring.
G ³	Spindles.	T ⁷	Ball-thrust bearing.
G ⁴	Driven member on gear-shaft.	T ⁸	Clutch-collar.
G ⁵	Trunnions on G ⁴ .	T ⁹	Clutch-fork.
H	Gear-box.	T ¹⁰	Clutch-pedal.
K	Driving shaft.		
K ¹	Pinion fixed to K.		
K ²	Jaw-coupling on K ¹ .		
L	Low speed lay-shaft.		
L ¹	Pinion in mesh with K ¹ .		
L ²	Pinion in mesh with N ⁴ .		
L ³	Sliding pinion.		
M	"Reverse" lay-shaft.		
M ¹	Pinion to mesh with N ¹ .		

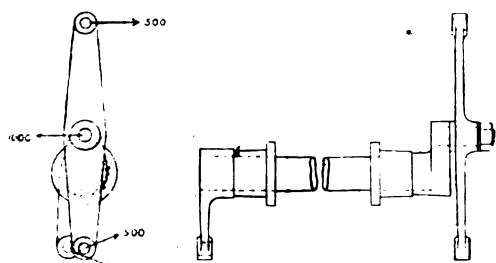


Fig. 14.—Diagram of the Albion Compensating Gear for the rear brakes.

the car to start with a jerk, since the oil between the discs only allows a progressive gripping action to take place. For this reason, therefore, it will be seen that clutches of this kind have many advantages, even for the lightest types of petrol vehicle, but that they are particularly valuable for the heavier forms of cars—such as luries and 'buses—where not only is far more damage liable to result from sudden starting strains, but there is also considerably more risk of the cars being handled by careless drivers.

The same thin film of oil that gives the "softness" to the clutch, and enables a car to be started from rest on a comparatively high gear—since it gives the required diminishing degree of slipping—is also responsible, however, for the difficulty in declutching, above-mentioned, because the viscosity of the oil is often sufficient to "glue" the plates together to such an extent that the engine can still continue to drive the car after the pressure, forcing the disks together, has been relieved. As is well-known, one of the features of the Hele-Shaw clutch—possibly the clutch of this kind that is best known to motorists at present—is that its rings are provided with small flat springs for overcoming this trouble, these springs, at all times, tending to separate the rings. In the Bradley clutch, however, no springs of any kind are relied upon for giving the desired effect, but the same portions of the mechanism that force the rings together—under the action of the clutch-spring—are provided with a series of fingers that give an equivalent, though positive, effect.

The actual construction of a "Bradley" clutch—which is only one of several types that are being made—is shown in Figs. 1 and 2, in which we have attempted, with the aid of photographs and of line drawings—coupled with a carefully considered system of lettering for the various parts—to overcome, as far as we can, the undoubted difficulties that there are of making structure of the apparatus clear on paper. In Fig. 1, the clutch is first seen from the side, with the small cardan-shaft, F, that connects it with the change-speed-gear lying alongside it, and with one of the sleeves, H²—by which it is operated—removed to show its cam-shaped jaws. To the right of this view, the clutch is shown from the rear end, with both the operating-sleeves, H and H², taken off, while—again to the right—is seen the ring, A², that forms a part of the flywheel-member, A¹—with the rest of the clutch (otherwise intact) alongside it; inside the ring, A², is shown the clutch-spring, E. The lower row of illustrations in the same figure are—reading from left to right—as follows: First, there is a view of the "driven" (or inner) member of the clutch removed from the "driving" portion, A, but the rings, A¹³—which are carried by this outer member—are still in place about the "driven" member; some of the guide-pins, A³⁰ (for guiding the rings), are in place inside the flywheel member, and others are in place threaded through their clutch-rings. The next view shows the inner member intact, except that all but one of the "driven" rings, C¹², have been removed, and that some of the guide-pins, C³⁰, for those rings, are also taken out. Again to the right, is the same portion of the mechanism, but, in this case, all the guide-pins, C³⁰, have been taken away; the

holes that they usually occupy are, however, denoted by the letter C³⁰, for convenience of reference. The ring, J², which constitutes the sliding member of the clutch, and presses all the discs, C¹² and A¹³, up together, has also been completely removed in this view. This view therefore shows the *separating* mechanism in particular, though it will also be noticed that it shows the operating-sleeves, H and H², in their proper places. The remaining view in Fig. 1 shows the ring, J²—which was removed from the previous view—and, alongside it, are seen one of the inner discs, C¹², that is carried by the "driven" member, and one of the outer discs, A¹³, that is carried by the "driving" member. Both these discs have a few of their guide-pins slipped through the holes that are drilled in them for this purpose, and the disc, C¹², is also slipped over the pins, J⁴, that serve to secure the ring, J², to the casting, JK (*see the other views*).

Included in Fig. 2, are four different cross-sections through the more important portion of the same clutch, while the other portions are well shown in the complete longitudinal section and in the end view. These four special sections have been shaded in such a way as to emphasize the two distinct functions of the mechanism. Thus, in the two upper sections, the parts that squeeze the discs together, and merely *allow* them to be separated, are blacked-in solid, while, in the two lower sections, those parts that *separate* the discs—and alternatively only *allow* them to be pressed together—are treated in a similar manner; the complete section is, moreover, so drawn as to show the discs when they are all forced up together, and the partial sections (on the right) indicate the positions that are assumed by the same portions when the discs are separated. It is because some of the same parts of the clutch are used for forcing the discs together, and, at other times, for separating them, that it is a little difficult at first to follow the action, and that it is well that each function should be understood separately. To facilitate matters in this direction, distinct letters have been used for each functionally different portion, and both letters have been used together for those parts that play a double *role*.

Referring to these illustrations, the external portion, A¹, forms the flywheel for the engine, and is fixed to the crank-shaft, A, which projects forward sufficiently far to form a bearing-surface for the driven member, B; this driven member is prevented from moving along the shaft, and has a cardan-joint, F—formed inside its overhanging end—for coupling it to the gear-shaft, G. The flywheel, A¹, has the loose flange, A², bolted to it by the fifteen bolts, A¹⁵, and this flange—in conjunction with the casting, A¹—serves to carry the thirty steel pins, A³⁰, as seen. The same bolts, A¹⁵, also hold the casing, A³ (which is not shown at all in Fig. 1), its duty being to render oil-tight the interior of the clutch. The thirty pins, A³⁰, form guides for the thirteen thin, metal rings (or discs), A¹³, which are, in consequence, free to slide longitudinally. These discs intermesh, as will be seen, with the corresponding inner discs, C¹², that are mounted upon the "driven" member, and they thus enable the power to be transmitted from the one member to the other, when the discs, C¹², are squeezed up tightly towards one another.

(To be continued.)



A MOTOR WAGON is being employed to bring prominently before the inhabitants of out-of-the-way places in England and Wales the agricultural producing powers

of Canada. It is loaded up with produce of all kinds—grain, fruits, straw, &c., from Canada—and is touring both England and the Principality.

RACES, RECORDS, AND TRIALS.

GORDON-BENNETT RACE AND THE GRAND PRIX IN FRANCE.

THE whole racing question has now arrived at a pretty muddle in the Republic. Some time ago we observed that the manufacturers who had somewhat precipitately declared that they would not take part in either race if the French club gave way to the representatives of the other national clubs and consented to run the Grand Prix and Gordon-Bennett separately, would have some difficulty in effecting a dignified retreat in view of the decision taken by the club to separate those two events. Presumably to cover their retreat, they have drawn up a certain number of resolutions, which they submitted to the A.C. de France. These proposals involved the general principle that races should be limited to the "strict minimum utile" (an expression which M. Georges Prade, not unnaturally, derides) required by the automobile industry, and that for 1905 the two Grand Prix races should both be done away with.

The Automobile Club de France met and discussed the situation at great length, the Chevalier René de Knyff, the Marquis de Dion, and other leading members being present. To cover the retreat of the manufacturers referred to above, the committee have decided to abandon the Grand Prix, at any rate for 1905 altogether, and to return the entrance fees which have been received. It was further resolved by the committee

1. To approach the Government of the Republic to permit only one annual test, and to honour the A.C. de F. by sending official delegates to this national festivity.
2. To request the press generally to support the programme of the club, and likewise to send official delegates.
3. To request the other public authorities to prohibit other high road speed races and only to authorise the single great event supported by the French club.
4. To ask all projectors and organisers of races already announced to abandon them (freely and spontaneously) for the sake of the general good.

The committee has further decided to disqualify any manufacturers, drivers, owners or others who take part in any races unauthorised by the club from competing in the races organised by the A.C. de F.

In conclusion, the club is opening a subscription to which it has contributed 25,000 francs, for prize money for the eliminating trials for 1905, and to this *L'Auto* has decided to add the 100,000 francs which had been offered as a prize for the Grand Prix; this will serve to add to the reward which the car that comes in first in that event will receive. Entries for the eliminating race must be sent in by the 1st April, and the fees have been reduced from 10,000 to 5,000 francs.

The resolutions which the club has adopted, as set forth above, refer only to the subject of racing, and do not in any way concern reliability or endurance trials.

It will be seen that the French club has thus ultimately been brought to adopt practically the same position as that taken up by the Automobile Club of this country, the need for which we have long ago and on many occasions pointed out, while at the same time observing that the nuisance of multitudinous races in France would ultimately lead to practically the state of affairs which has now supervened.

It is stated in France that by way of smoothing over the irritation which has arisen amongst those interested in the promotion of the Grand Prix de la Republique at Aix les Bains, the A.C. de France have intimated to the

authorities at Aix that the Grand Prix of the A.C. de France in 1906 will be run on the Savoy Circuit.

The German Automobile Club, it is announced, have decided to hold no eliminating trials for the Gordon-Bennett Race, but to rely entirely upon the efforts of the Mercedes cars to secure the trophy for a second time.

ENTRIES FOR THE TOURIST TROPHY.

THE race for the Tourist Trophy, to which we refer editorially in the present number, and of which we gave the rules and regulations on December 10th last, is attracting very general interest and attention amongst automobilists, and already the following firms have entered a total of thirty-one cars for the event:—

Entrant.	Car.	Entrant.	Car.
1. Hon. C. S. Rolls	Rolls-Royce	17. Star Co.	Star
2. S. F. Edge	Napier	18. Hozier Co.	Argyll
3. Cecil Edge	Napier	19. Hozier Co.	Argyll
4. Daimler Co.	Daimler	20. T. B. Browne	James and Browne
5. Daimler Co.	Daimler	21. Anglo-Amer. Co.	Cadillac
6. Speedwell Co.	Speedwell	22. C. C. Maudslay	Maudslay
7. Speedwell Co.	Speedwell	23. Hon. C. S. Rolls	Rolls-Royce
8. W. H. Astell	Orleans	24. Vauxhall Co.	Vauxhall
9. W. H. Astell	Orleans	25. T. C. Pullinger	Beeston-Humber
10. H. Austin	Wolseley	26. Swift Co.	Swift
11. J. D. Siddeley	Siddeley	27. Swift Co.	Swift
12. T. Thornycroft	Thornycroft	28. Ryknield Co.	Ryknield
13. Fred. R. Simms	Simms-Welbeck	29. Fred. Coleman	White Stm.
14. Deasy and Co.	Martini	30. Fred. Coleman	White Stm.
15. Brit. Automobile Com. Synd.	Spyker	31. T. C. Pullinger	Beeston-Humber
16. Star Co.	Star		

Blackpool Motor Meeting.—It has been definitely arranged for a three days' motor meeting to take place at Blackpool on July 27, 28 and 29 next. This will be under the auspices of the A.C.G.B.I. Following shortly after the Brighton motor meet, the foreign racing cars, which, it is hoped, will cross over to England to take part in the Brighton events, will be able to participate in both the Brighton and the Blackpool meeting without having to re-cross the water. The new promenade at Blackpool, which is being now actively completed, will, by that date, be in perfect order to enable the flying kilometre or mile to be covered at record speeds.

Nice Automobile Week.—We announced some time ago that the organising committee of the Nice A.C. had determined to abandon the speed trials for records over the mile and kilometre during the great Nice Week.

Mr. S. F. Edge points out that it is somewhat curious that this should happen directly Britain holds the world's record for speed, as Nice is considered one of the most important speed competition meets on the Continent. We, like most of those who have the sport at heart, will regret not being able to see Mr. Macdonald maintain the splendid reputation which he has already made by further lowering the mile time and successfully competing against the crack racing cars of the world on the Nice speed course.

IN connection with the Nice week, the usual Tourist Car Run is to be somewhat elaborated this year, and will comprise a long distance run on the first day, and on the second a series of tests in order to determine the

winning cars, consisting of hill-climbs, turning corners, and stopping power, silence in running, absence of dust, &c. The element of speed will not enter into the contest and the cars will be classed in four categories, according to their horse-power. Points will be awarded for each of the contests and the results arrived at from them.

DURING the latter part of August an important contest for tourist cars is to take place in France for a trophy entitled the "Coupe des Pyrénées." The distance of the course will be about 1,200 kilometres, starting from and returning to Toulouse, and visiting the following main points:—Castelnaudary, Carcassonne, Beziers, Narbonne, Perpignan, Foix, Luchon, Cauterets, and Biarritz.

Vanderbilt Cup.—Further grace for entering for this cup has now, it is announced, been accorded until May 15th instead of April 15th. In addition it has been decided to adopt the principle that each country may be represented by five cars instead of six, as in 1904.

The Bengal Reliability Trials.—India has again given proof, not only that her people take an active interest in the automobile movement, but also that the Anglo-Indian community can organise and carry out reliability trials for motor vehicles with great success, and practically without a hitch. The Bengal Reliability Trial, which consisted of a run from Calcutta to Asansol and back—a distance of 276 miles—on the 9th and 10th of February, was not quite such an elaborate function as the Delhi-Bombay event, the time involved and the distance covered being considerably smaller, but as usual, the glorious, certain, winter climate of India justified the confidence reposed in it, and rendered the enjoyment of the run as great as was its importance from the technical and commercial point of view. As in the Delhi-Bombay Trial, the arrangements made by the police, and the hearty and sensible co-operation of the inhabitants, were deserving of the highest commendation, and nothing in the nature of a casualty to any of the ordinary road users occurred, though, unfortunately, one "luckless Indian," by getting in the way at one of the few points where police supervision was somewhat deficient, caused the smash-up of the 6-h.p. De Dion driven through the trial in exceedingly plucky style by Mrs. Allen, who won the bracelet presented by Mr. H. H. Reynolds.

Similarly characteristic of India were the excellent catering arrangements made for supplying all along the route everything that those interested in the event could require, while at Burdwan the assembled motorists enjoyed the hospitality of His Highness the Maharajah. A curious circumstance attending the run was that the part of it passing through Chandernagore actually took place on French soil—that old-world spot being one of the two remaining fragments of French power in the peninsula.

In all thirty cars had been entered for the event, and of these the satisfactorily high proportion of twenty-eight turned up at the start.



Liverpool Automobile Show.—This year the annual Show is held in the North Haymarket, instead of St. George's Hall, on account of the increased demand for space on the part of motor cars, which now attract the attention at one time bestowed upon ordinary cycles. Several of the Olympia models were again to be seen on the stands of local agents. Messrs. J. A. Lawton had a

Amongst the entrants were the Lieut.-Governor of Bengal, who was represented by a 15-h.p. Darracq car, and the Maharajah Tikari who pinned his faith to a 10-h.p. and a 6-h.p. Oldsmobile. Of this latter make there were no less than 7 entered out of the full list of competitors, and British cars were represented by 2 Thornycrofts, a Lanchester, 2 Rational cars, a 6-h.p. Wolseley, 2 6½-h.p. Humber cars, a 6½-h.p. Siddeley, a 7-h.p. Alldays Traveller, and 2 Rex cars. The moving spirit in the details of the competition at Asansol was Mr. Agabeg, Mr. J. H. Rolfe being the honorary secretary and organiser. The trials were under the patronage of the Hon. Sir A. H. L. Fraser, K.C.S.I., Lieut.-Governor of Bengal, and the other officials were:—

Judges.—The Hon. Mr. J. P. Hewett, C.S.I., C.I.E., I.C.S., and Mr. J. G. Dickson.

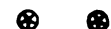
Committee.—Dr. J. Nield-Cook, chairman; Mr. E. J. Oakley, vice-chairman; Mr. A. J. Dent, Mr. F. Marsh, Mr. Oldbury Burne, and Mr. S. E. A. Whiteway.

Although at times the roads were in splendid condition, and enabled the higher-powered cars to display their speed qualities to the best advantage, taken on the whole the route selected was a severe one, and at places produced difficulties which tested the best capabilities of the cars. In the early part of the run, as usual, tyre difficulties cropped up frequently; Mr. Inglis's De Dion being unfortunate in this respect, compelling him to retire, and one of the earliest sufferers in the run was the Lieut.-Governor's own Darracq.

The Heatly and Gresham Co's. Rational car was among the first in, although they had, during the day, broken a chain. In the second day's run this car was also among the first to arrive at Calcutta, which is an excellent testimonial to the reliability of this car for Indian work as fitted with solid tyres, for it maintained an average speed of 19·64 miles per hour, and the petrol consumption was 26·6 miles per gallon. This performance secured for the Rational car the Leslie Cup, which is the highest honours in her class. Prizes of equal value were awarded to the De Dietrich and Lanchester cars in Class A, but the Thornycroft car, which did equally well, was disqualified because the driver had to change places with his mechanic through badly burning his hands when rescuing the car from a fire on the previous night. The Walter Lock Cup was awarded to Mr. Apar's Humberette, while Mrs. J. H. Allen, who drove the 6-h.p. De Dion, secured the second prize in this class, and also the bracelet presented by Mr. H. H. Reynolds for the best performance by a lady.

The sportsmanlike act of Mr. D. L. Sil, who took on board some benighted motorists whose car had broken down, and thus disqualified himself, received praise-worthy recognition at the hands of the committee, who awarded him the special prize presented by the Russa Engineering Company.

In the motor cycle section, Mr. F. M. Lane, on an Excelsior, won the Tikari Cup, while Mr. A. A. Bachmann, on a Peugeot, and Mr. A. M. Clark, on a Singer, received second and third prizes respectively.



fine exhibit of Napier, Panhard, and Mercedes cars, while the Road Carrying Company showed Crossley and Argyll cars.

The Show, which closes to-day, Saturday, has attracted a very considerable amount of local interest, not only for the touring cars, but for the heavy vehicles, which were of a most representative character.

STEEL AS APPLIED TO MOTOR CAR CONSTRUCTION.*

By J. S. Critchley, M.I.Mech.E.

WITH large pieces of metal, such as large bars and plates, the matter of annealing is a very difficult one, as it is absolutely necessary that the metal should be cooled evenly and regularly; in fact, it presents such great difficulties that it is often considered safer to take the metal as it leaves the rolls than risk any damage by subsequent treatment.

However, with forgings of moderate size, the difficulty is greatly minimised, as these parts can be heated in a special furnace, and the heat and cooling more easily manipulated. In actual practice, forgings, such as guns, axles, and shafts, are heated to a temperature of 1,472 deg. Fah. to 1,562 deg. Fah., and then quenched in oil at a temperature of 176 deg. Fah., and subsequently reheated from 1,022 deg. Fah. to 1,200 deg. Fah. Some steelmakers, however, never reheat above 662 deg. Fah. The quenching is carried out in a large tank, into which the steel is very quickly dropped on its withdrawal from the furnace, where it remains until cold, and it is then removed and reheated. With a large number of tests carried out by Mr. Thomas Bunt, with forgings from acid Siemens ingots, and heated to a temperature of 1,472 deg. Fah., quenched in oil, and reheated to 932 deg. Fah., it was found that the maximum stress was raised from 32 tons per square inch, with 27 per cent. elongation in 2 in., to 40 tons tensile strength, with 23 per cent. elongation, giving an increase of 24 per cent. The elastic limit was not taken with these tests, but from similar ones it was found to be raised about 15 per cent.

Testing.—There are a number of tests to which steel may be put in order to determine its suitability for any particular purpose. First, we have tests to determine if the material is free from the defect known as "red-shortness" at all temperatures above a red heat, and that it will weld properly. Secondly, we have physical tests, from which the strength, ductility, toughness, or brittleness of the metal is deduced.

These physical tests are, of course, made at the normal temperature.

The tensile strength or maximum stress is the ultimate load the material will stand by a direct pull. It is expressed in pounds or tons per square inch, or in kilogrammes per square millimetre. To convert kilogrammes per square millimetre into tons per square inch multiply by '635. The tensile strength is specified in order to ensure that the material has all the necessary strength.

Elastic Limit.—The elastic limit is a correct guide as to the suitability of any material to resist working stresses. It is expressed in the same terms as the tensile strength. Steel is more or less an elastic substance, and under load will stretch, and then return to its original form or size; only, however, up to certain limits, of course. When the load exceeds that point the material no longer returns to its original form or size. The material which is strained or worked up to its elastic limit is, of course, structurally ruined. For all purposes where steel is subjected to shock the elastic limit should bear a very high ratio to the tensile or maximum stress. In motor car work this is an important point, so that sudden shocks or impacts do not deform the metal.

Elongation.—The elongation is in a large majority of commercial steels a true guide to static ductility. It is the increase in length of the bar which takes place when pulled asunder to determine the maximum stress, and is usually expressed as the percentage of the increase in length. It is, however, always necessary, in taking into account the elongation, to have stated the length of the tested piece, because at the point of fracture, after the elastic limit has been reached, there is always a considerable local elongation at the time of fracture. Thus the percentage will always appear to be greater in short test pieces than in longer ones.

Reduction of Area.—The reduction of area is brought about by the elongation of the material under stress. When the sample test piece is broken the area of the fractured portion is in ductile steels less than the size of the original bar; it is expressed in percentages as compared with the size of the original test piece. In steels having the same tensile strength those which show the highest elongation and reduction of area may be taken as being the most ductile.

Bending Tests.—Cold bending is a valuable indication of the structure of the metal, having a close relation to the contraction of area. Steel having a high contraction of area will always stand severe cold bending, and *vice versa*. In all steel forgings for motor cars a $\frac{1}{2}$ in. bar should bend close double without sign of fracture.

Impact Tests.—I am of opinion that for motor car work, or for any structures subject to alternating loads and severe and sudden stresses, the ordinary static tests should be supplemented by dynamic

tests. Unfortunately, this description of test is not yet properly standardised, but many steelmakers and users of steel carry on these tests in their own particular method.

These tests usually consist of impact tests on flat bars and impact on notched bars. The impact or shock test on flat bars consists in dropping a weight on to a bar which is supported at each end, and noting the deflection after a certain number of blows.

The same test is also carried out on notched bars, which is a better guarantee as regards toughness.

The following table gives the results of bars tested in the above manner by Messrs. Krupps:—

TABLE 3.

Dimensions of test bar, 11'8 in. long by 1'18 in. by 1'18 in.; distance of supports, 9'43 in.; weight of tup, 0'2 tons; depth of notch, '04 in.

	Mild steel.	Special nickel steel.	Mild nickel steel.
Tensile strength, tons per square inch	34'9	53'5	36'3
Elastic limit, tons per square inch	19'7	44'9	29'1
Elongation in 5'9 in., per cent. ...	25'8	16	23'6
Contraction of area, per cent. ...	58'2	67	71'6
Deflection of plain bar in inches, five blows (height of fall 39'37 in.)	3'86	2'67	—
Deflection of notched bar in inches (height of fall, 19'68 in.; blows, ten)	Bar broke at first blow.	3'81	3'85

The toughness given by the nickel alloy is clearly shown in the above table.

Arnold's Tests.—Arnold's test consists in reversing the strain very rapidly. The bar is held in a vice, and is vibrated to and fro very rapidly, until the piece breaks in two, the number of vibrations or reversal of stress being automatically recorded.

In addition to these physical tests, there is also the chemical analysis and the microscope. The latter now shows some really remarkable phenomena, revealing the various structures of steel which have been subjected to heat treatment.

Photo-micrography has been responsible for a very great development in the art of steel making. By treating or etching highly-polished specimens of steel with acid or iodine and other chemicals, the texture, as it might be termed, of the steel is produced, and by means of the microscope and camera the constituents of the material can be very clearly brought to view. Just as crystals of salt and water in the brine solution can be identified by the microscope, so can the constituents of the metal. By means of these micrographs it is found that steel can be made up of quite a number of constituents; thus we find free iron, to which the name of ferrite has been given. The carbide in low carbon steels is found in the form of pearlite, and this form is a characteristic of steel which has been slowly cooled from a high temperature. Steel containing about '9 per cent. of carbon usually consists entirely of pearlite, the percentage of '9 being about the total amount of carbon which will entirely unite with iron at a temperature of about 1,472 deg. Fah.

Cementite is a constituent usually found in high carbon steels; its chemical formula is Fe₃C.

Martensite is another constituent; it is the form of structure found in steels that have been hardened. In addition, other constituents are found, to which the names of austenite, troostite, and sorbite have been given, each characteristic form being the result of different methods of heat treatment with varying percentages of carbon.

It is my privilege to be able to show you to-night a series of micrographs of steels, the work of that famous French engineer and metallurgist, M. Osmond. These micrographs have been very kindly lent to me by Mr. F. R. Stead, F.R.S., who has edited an English translation of Mons. Osmond's charming work "The Microscopic Analysis of Metals."

In face of all the tests steel can be put to, and even with the aid of chemical analysis and the microscope, there is still one test which must always be the final and best test of all, namely, the use of the material, as to whether it serves the purpose for which it is intended. All tests may be said to be merely indications—generally very good indications, but when steel is to be applied for a new and particular purpose, for instance, the gears of a motor car, there is a great deal to be learned from actual use.

Probably the first gear wheels which were made for motor cars were made from cast metal, with the teeth cast in, and the next stage would probably be wheels of mild or cast steel with machine

* Excerpt from a Paper read before the Automobile Club on February 9th.—Continued.

cut gears, probably very good material for certain purposes, but totally unsuited for the rough usage of sliding gears. The next stage in the evolution of gears was doubtless the case-hardening, with all the difficulties and troubles of overheating, warping, improper quenching, &c. The improved methods of dealing with this material in order to obtain a very hard outer surface, which would not chip, and a soft and ductile interior, are the next stage. We then come to the use of nickel steels, and nickel chrome steels. Many of these steels do not require case-hardening at all, while others are made of a special quality which case-hardens very well indeed. The great art in case-hardening gear-wheels is to prevent distortion on quenching. This can only be accomplished by a man who has had a lot of experience in the work. The temperature of quenching is also a very important one, as if quenched at too high a temperature the surface of the metal is very brittle. Some nickel chrome steels do not require case-hardening, are oil tempered, and the material is in itself tremendously hard; in fact, so hard that special tool steel has to be obtained in order to shape the gears. I well remember the first nickel chrome steels which I applied to gear-wheels in the year 1900. I submitted a sample of the steel to some tool makers who were at the time supplying a special machine for gear-work. This material, I may say, quite upset all their preconceived ideas as to the cost of production; the cost of cutting these wheels was quite double the cost of cutting ordinary mild steel. I may say that so satisfactory were these wheels, that many of them are to-day practically as good as when they were put in.

A new steel for gears, which has just been put on the market, is a French invention, the sole rights for France having been taken up by one of the largest builders of motor cars in Paris. This steel is carburised in the usual way by heating in boxes with the usual case-hardening substances, the time required being about seven hours, at the usual temperature of about 1,470 deg. Fah. The parts are, however, not quenched, but allowed to cool gently, when they become quite hard. As it is not necessary to quench in water the parts are not distorted. However, the most remarkable characteristic of this steel is that, as it is subjected to strain and friction, the harder and tougher it becomes. The physical tests of this steel are as follows:—Tensile strength, 33·4 tons per square inch; elastic limit, 24·8 tons per square inch; elongation in 2 in., 31 per cent.; and contraction of area, 69·5 per cent.

Vanadium Steel.—The valuable properties of an alloy of vanadium and steel have long been recognised, as it is perhaps the most powerful of any alloy yet known. Even so low a fraction as one or two-tenths per cent. will raise the elastic limit of low carbon steels by 50 per cent.

Recent developments which have been carried out by Mr. Kent Smith, the inventor, of a new process for producing vanadium steel at the works of Messrs. Willans and Robinson, Queensferry, have produced some excellent results, and the steel would appear to have exceptionally good qualities. The percentage of elastic limit to ultimate stress is generally high, and the ductility, as shown by the percentage of elongation, is superior to any steel of equal tensile strength. The impact and bending tests of this steel are excellent—in fact, they are superior to a 30-ton mild forging steel of good quality.

Some interesting details of these steels have recently been given before the Institute of Mechanical Engineers.

This steel can be made in an open hearth, it will weld, and is certainly not so delicate as regards heat treatment as are many high-grade steels.

I should just like to quote a few words spoken by Professor H. le Chatelier on this subject of steel. He says:—"One of the objects to be aimed at should be co-operation amongst seekers of knowledge. It was difficult to estimate the amount of wasted effort in the laboratories of the world through this want of co-operation. It was enormous compared with that of industrial work. It was only within the last 25 years that any considerable movement had taken place in metallurgical study. Some new methods had been adopted, but only on a very feeble foundation. Some considerable progress ought to have been made, in view of the enormous mass of literature that had accumulated. It was a mere trifle, though; obscurity was met with everywhere, when it ought to be clearness, which was the characteristic of every well-established science. When one saw all that remained to be done, the uncertainties of such a complex subject as the thermal treatment of steel were readily explained. Very slight variations in the temperature of annealing, and in the rapidity of the change in temperature, were able to alter the result entirely. To fill up rapidly all the gaps in the knowledge of this subject required the hearty assistance of all interested in progress."

THE third annual general meeting of the members of the Aero Club will be held on March 16th, at 110, Piccadilly, when Mr. Roger W. Wallace, K.C., will occupy the chair.

A VARIABLE MOTOR CYCLE GEAR.*

THE ratio 4 to 3 between the steps in this particular gear was partly determined by the convenience of having the sun and planet pinions the same size. But it had the further advantage that it gave a practically continuous variation of gear. The reason of this is that the engine gives a maximum brake horse-power at a particular speed; in the present instance about 2,000 revolutions, as shown in Fig. 5. For speeds in the neighbourhood of the maximum the power exerted changes little. Thus, if the gear is changed down in the ratio of 4 to 3 when the engine speed has fallen to, say, 1,500 revolutions, the speed of the engine at once rises to 2,000 revolutions, or a little over, and the speed of the machine is slightly

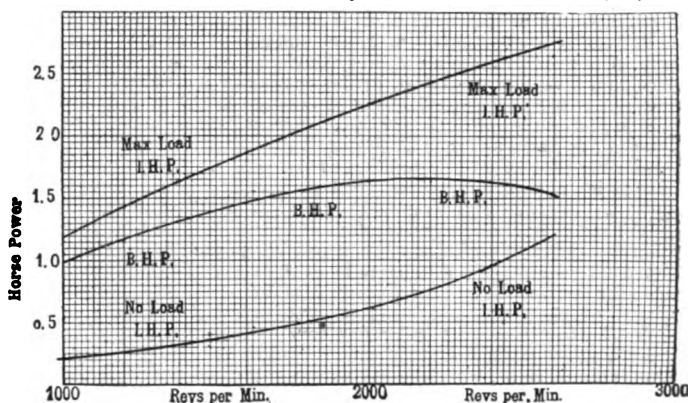


FIG. 5.—GRAPHIC REPRESENTATION OF RELATION BETWEEN HORSE-POWER AND SPEED.

accelerated. With a larger change of gear, such as 2 to 1, the engine would race beyond its most efficient speed, the power would drop, and the speed of the machine would diminish on changing down. With a sufficient number of small steps, and an efficient system of fan cooling, it is possible to keep the engine running all the time very near its maximum power, by changing the gear to suit the gradient and the road surface. It might be thought that the advantages of continuous variability were not worth the extra complication of having so many speeds, and that mistakes and accidents to the gear would be of constant occurrence. In reality the manipulation is extremely simple, and it is practically impossible to make a mistake or damage the gear. There are three positions of the back-gear-lever, giving first, second, and third speeds in order. The fourth and fifth speeds are obtained by the degree of back pressure applied to the pedals. The pedal-gear is changed by the same lever as the engine-gear, so that it is impossible to get on the wrong pedal-gear. Whatever the position of the gear-lever, back pressure on the pedals always puts in the fourth or fifth speeds in the right order, and back-peddalling gives the appropriate pedal-gear for assisting the engine at the highest speed. Pedalling forwards changes the gear down again, and gives pedal assistance to the engine on the appropriate gear.

The arrangement above described was mainly determined by the fact that the epicyclic gear already fitted to the machine gave a change of gear in the ratio of 4 to 3, and must be combined with a

TABLE OF GEARS.

No. of gear.	Speed, m.p.h. engine, 2,000.	Gear ratio. Engine-wheel.	Pedal gear. ins.	Ratio revs., engine-pedals.	
				Starting.	Driving.
1	7½	20	26	14	20
2	10	15	26	14	15
3	13	12	50	22	26
4	17½	9	—	—	—
5	23	6½	120 (var.)	—	25 (var.)

second gear of the same kind to give sufficient range and simplify replacements. In making a fresh start, a neater gear could be designed on similar lines, retaining most of the advantages already enumerated. By fitting a single epicyclic gear in the hub, instead of on a countershaft, with the sun pinion half the diameter of the ring, but otherwise exactly equivalent to the back-gear already described, it would be possible to get three engine gears, giving a range from 6 to 15, and three pedal-gears and a free-engine with

* Abstract of a paper, by Prof. Callendar, read before the members of the Auto Cycle Club, on Wednesday, February 8th, 1905 (continued).

two motor-chains and two pedal-chains. The chief objection would be that a special hub would be required, with ball-bearings between the various members of the gear, instead of plain bearings, owing to the weight on the wheel. Also, that the gear would be less accessible. The gear might, however, be made very light and compact, for reasons already given. The gear might be simplified further by omitting the free-engine-gear, or a fourth speed might be added in place of it. There are many possible ways of applying the general principles of construction already explained.

Referring to the table, the first column gives the number of the gear, beginning with the lowest, which is generally used for starting. The second column gives the speed of the machine in miles per hour, when the engine is running at its normal speed of 2,000 revs. per min., at which it exerts its maximum power on the wheel. The engine can run easily at 2,500, and also at less than 1,000, so that there is a wide range of speed on each gear. The third column gives the gear-ratio, or the number of revolutions of the engine to one of the wheel. Except between 2 and 3, the ratio of each gear to the one above it is 4-3. The pedal-gear in the fourth column is stated in terms of the equivalent diameter of the back wheel in inches for one revolution of the pedals. The pedal-gears of 26 ins. and 50 ins. are designed to suit the 20 and 12 engine-gears. Pedal assistance on the top-gear is by back-peddalling, which adds speed, not power, and is intended to prevent the engine racing on a moderate declivity. When pedalling forwards the rate of pedalling must bear a definite ratio to the speed of the engine, but on the back-peddalling-gear the speed added is proportional to the rate of pedalling, but independent of the engine speed. It is possible to add about 5 miles per hour to the top speed without allowing the engine to exceed 2,000 revolutions. In pedalling to start the machine, when the pedals have to drive the engine, it is advantageous that the number of revolutions of the engine to one of the pedals should be small, as it makes it easier to start. But when the engine starts it should drive on the low gear. This is illustrated in columns 5 and 6. In starting on the low gear the pedals drive the engine at 14 to 1, but when the engine drives the ratio is 20 to 1, which makes it easy for the pedals to keep pace. In starting by pushing the engine makes seven revolutions to one of the wheel, but as soon as the engine starts it drives on a gear of 20 to 1. The above are the actual gears in use at present, but it will be understood that they can all be changed in any desired ratio by changing one or two of the sprockets.

No one will deny that, other things being equal, it is an advantage to have a light machine. It is easier to store and handle. My own machine cost £60, and weighs only 2 cwt., though it comes nearer 250 lbs. or 260 lbs. when fully equipped with petrol, accumulators, tools, and spares, &c., for touring. The forecar frame is of ample strength, being designed for a heavier engine. For comfort and safety on a light machine you must have a light engine. My own weighs only 22 lbs. This, of course, necessitates a good variable gear if you want to be able to take a passenger anywhere without exertion. But a light engine with a good variable gear is a much more pleasant and flexible machine to handle than a heavy engine with an inferior gear. The only disadvantage I have so far discovered is that you cannot much exceed the legal limit of speed with an engine as light as mine, and a load of 5 cwt., except under favourable circumstances.

The expenses of travelling a distance of 12,000 miles on an average gear of 10 to 1:—Engine, 60 by 70 mm.; average speed, 15 m.p.h. (including some 4,000 miles in traffic); average load, 560 lbs.; maximum, 630 lbs.

	£	s.	d.
Petrol, 122 gallons (various prices) ...	7	10	0
Lubricating oil, 5 gallons ...	1	5	6
Lamp oil and carbide ...	0	15	6
10 tyre covers, 7 inner tubes ...	15	0	0
Repairing bursts, &c. ...	1	1	6
Replacing mudguards and stays ...	0	17	0
Replacing broken spokes ...	1	10	0
New wires and brake-blocks ...	0	19	6
2 pedals (lost), 5 pedal free wheels ...	2	0	0
15 spark-plugs ...	1	10	0
2 accumulators ...	1	9	0
5 platinum contacts ...	0	7	6
Engine—New bushes, rings, levers, &c. ...	0	13	6
7 exhaust-valves, 3 inlet-valves ...	1	19	0
Transmission—30 chains, 10 chain-wheels ...	4	15	0
Gear—Ratchets and leather bands on Garrard gear ...	0	13	0
Rollers, springs, and balls ...	0	2	2
Licences—Registration, &c. ...	3	5	0
Accessories—Lamps and number plates ...	2	2	6
Speedometer, cyclometers (5), horns (3), bells (2) ...	3	0	0

Clothing—Coat, leggings, caps, &c. ...	4	5	0
Subscriptions—A.C.C. and C.T.C., &c., 3 years ...	4	4	0
Forecar—Recovering and repairing ...	1	15	0
Accidents—New frame, wheels, crank-case, &c. ...	25	2	6
Total ...	85	16	8

If we exclude the last seven items, as not representing fair wear and tear of the machine, the cost works out at 0.84d. per mile. Accidents, however, are inevitable. On one occasion the machine was charged by a dray while standing outside a shop. On another it was run into by a cab from behind in a traffic block. These two accidents alone cost over £20 in their results. Including all the above items, and allowing, say, 30 per cent. for depreciation, the cost works out at nearly 2d. per mile for two passengers, which is equivalent to third-class railway fare. There was no expense for storage, the machine was hardly ever cleaned, and I was able to do most of the small replacements and repairs myself.

The consumption of petrol works out very nearly at 100 miles to the gallon, which is very fair considering the gear and the load. The consumption of tyres may appear excessive, but was aggravated at the outset by the fitting of two pairs of Dunlop multicyle tyres on the forecar, which went to pieces in less than 1,000 miles each. Four of the other six covers and tubes are still good for spares. The chief troubles with the wheels have been the breaking of mudguard stays and spokes. The spokes (13 gauge) break short off at the hub, owing to the excessive strain caused by the small diameter of the hub flanges. This has been a common source of trouble with forecars during the past season owing to low gears. The excessive destruction of pedal-clutches was caused by defective strength combined with insufficient protection from mud. Since fitting a chain case and a strong Micrometer free wheel, I have had no further trouble for eighteen months. The best porcelain sparking-plugs would not stand running long distances at full throttle. An E.I.C. mica plug lasted 4,000 miles, but was always getting foul. I have since made a special pattern of mica plug, which cannot foul, and promises to run indefinitely. The first pair of accumulators gave out in 1,000 miles, and were replaced by two small spares, which are still good. The engine has worn very well, with the exception of the valves, which were too weak, and were always breaking and dropping into the cylinder. Luckily they never did any other harm. This trouble has been cured by making the stem of the exhaust-valve much thicker, and by brazing a bit of steel in the cottar slot of the nickel inlet-valve, which was continually hammering through. The consumption of chains and chain-wheels is considerable, but fortunately they are cheap and easily replaced. The most surprising item in the list is the small cost of gear-replacements. This shows the advantage of the epicyclic-gear, with engagement by friction, over the usual type. The Garrard gears and moderatum discs appear to be everlasting. The engine never jams the gear-clutches. The only replacements have been one ball, one roller, and two springs in the forward gear, in addition to the ratchets and leather bands, and two or three moderatum rollers on two occasions in the back gear. The latter are very easily replaced, and two or three worn or broken do not in any way disable the machine.

PUBLICATIONS RECEIVED.

The Clincher Guide to the Main Roads of Great Britain, &c. Edinburgh: The North British Rubber Company, Limited, Castle Mills.

Sauvenir De Dion Bouton. How De Dion Bouton Cars are Built. London: De Dion Bouton Company, 10, Great Marlborough Street, W.

Automobil-Kritik. By Max R. Zechlin. Berlin: Mittel-europäischer Motorwagen-Verein. 6 marks.

The Wolseley Pocket Book for Automobilists. Birmingham: The Wolseley Tool and Motor Car Company, Limited.

Thrupp's Motor Index Marks. Bradford: T. Thrupp. 1d.
Motoring Annual and Motorists' Year Book, 1905. London: "Motoring Illustrated." 5s.

Catalogues.

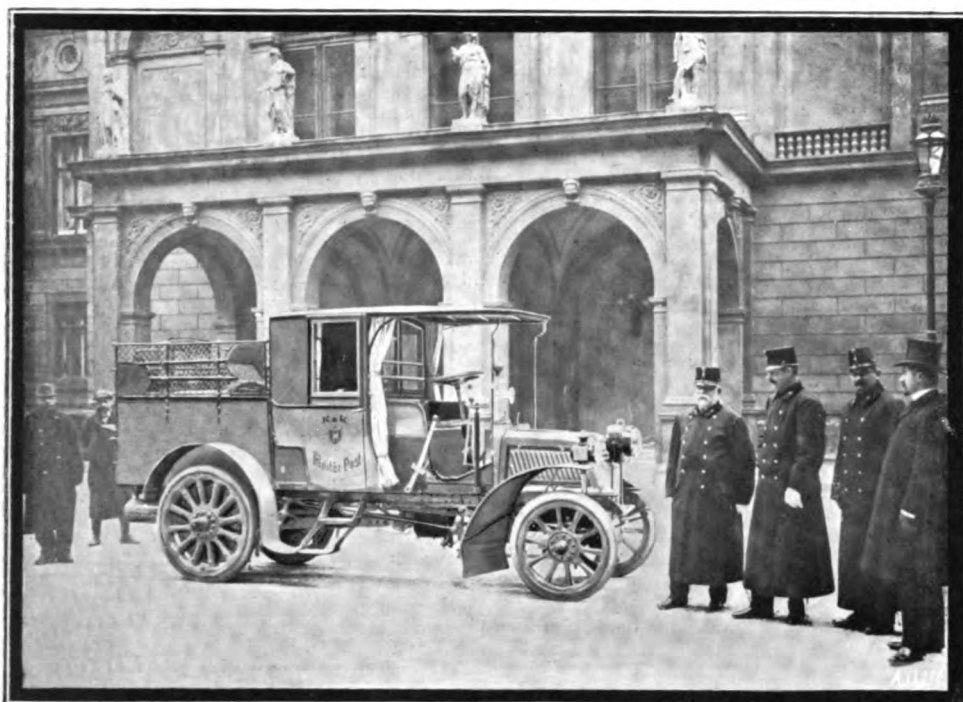
Clincher Pneumatic Motor Tyres. Edinburgh: The North British Rubber Company, Limited.

Collier Tyres. London: The Collier Tyre Company, Limited, 127, Long Acre.

Motor Clothing, &c., 1905. Birmingham: The Dunlop Rubber Company, Limited, Manor Mills.

Dunlop Motor Tyres, 1905. London: The Dunlop Motor Tyre Company, Limited.

Ariel Cycles and Motor Cycles for 1905. Birmingham: The Ariel Cycle Company, Limited.



1 2 3 4

The above photograph shows the Austrian military post car, designed for use in Bosnia, being presented for the inspection of H.I.H. the Archduke Leopold Salvator. The personages in the photograph are: 1. His Excellency the Knight of Wulich, Commissary General; 2. H.I.H. the Archduke Leopold Salvator; 3. Capt. Robert Wolf (the designer of the car); and 4. Herr Berge.

POSTAL services abroad are making more and more use of the automobile, both for heavier service and for distributing letters and light parcels. The Governments of Germany, Austria, Hungary, and Russia are particularly prominent in this respect, and a very fine car designed by Herr Robert Wolf, which has been recently supplied to the order of the Austrian Imperial Government for military post duty in Bosnia, has been submitted to the inspection of His Imperial Highness the Archduke Leopold Salvator. Various motor vehicles have also been employed by the German postal authorities, and now they have added to their equipment motor tri-cycles designed for parcel post delivery and to be used in Berlin. The Russian postal authorities

are also following suit, and postal service cars built by the Maurer-Union Company of Nürnberg have been recently supplied to the Russian postal authorities, and will enter upon their postal duties in Odessa at an early date. We are able to reproduce views of these various vehicles in the photographs on this and the next page.

WINDING-IN large kites is a highly-exhausting operation. In fact, with big multiple kites, it is more than a man can tackle, and Mr. Cody, who is well known for his designs of various kites, has got out a chassis with a small petrol motor and winding gear, fitted for the special purpose of managing his large high-flying kites. The machine is being built at the Crystal Palace, and will shortly go to Aldershot for military kiting.



The Maurer-Union Company of Nürnberg have recently constructed postal service cars for the use of the Russian Postal Authorities in Odessa. The above photograph shows the cars in question, shortly before being forwarded to the scene of their future activity.

CLUBS AND ASSOCIATIONS.

Blackheath A.C.—The annual general meeting of the club was held last week at Nos. 44 and 46, Tranquil Vale, Blackheath, when Mr. J. Horace Reeves was in the chair, and the annual report and balance sheet were adopted. The following officers were elected for the ensuing year:—President, Lord Hugh Cecil, M.P.; vice-presidents, Sir John McDougall, L.C.C., Col. H. C. L. Holden, R.A., F.R.S., Professor Carlton J. Lambert, M.A.; hon. treasurer, H. J. Fisher; hon. secretary, Alfred Roberts; meets captain, L. Beadle; committee, H. A. Cunis, Dr. J. S. Goodall, Arthur Jackson, Leslie C. Lambert, Ralph Lucas, H. Norfolk, S. T. Norfolk, J. T. Prestige, jun. The hon. secretary reported that many new members were joining, and that there was every prospect of the club having a most successful ensuing year. At present their membership was 39, the club having been only founded in April last. It is proposed to arrange, if possible, during the season some joint races, meets, and hill-climbs with the Kent and East Surrey clubs and the parent body.

Irish Automobile Club.—A very representative gathering took place last week at the Club Garage, South Anne Street, Dublin, when the club met for their general meeting. Mr. W. G. D. Goff, chairman, presided, and the committee's report for the past season, which was read by Mr. E. White (hon. sec.), was both interesting and instructive. During the year, the new club garage, which cost the club £420, was opened to members. A loss was made on the speed trials at Portmarnock, September of last year, £170 being required to defray the expenses over and above the income derived therefrom—the speed trials being otherwise a success, more especially from a sporting point of view. Over one hundred new members joined during the past year and the committee decided to affiliate to the Automobile Club of Great Britain and Ireland under Scheme 3 for the future, instead of Scheme 1 as heretofore. The report and statement of accounts, which showed a loss of £134 6s. 8d. on the year's working, were passed, after which the following were elected for the coming year:—President, the Right Hon. Sir H. Plunkett; chairman, W. G. D. Goff; vice-chairman, Thomas Talbot Power; committee, R. J. McCreedy, F. Hall, R. Murdoch, W. B. Jamison, T. Plunkett, Lieut.-Colonel Chandler Knox, C. Wisdom Hely, C. G. Townsend, S. Geoghegan, Humphry Bland, J. Ellis Goodbody, J. M. Davies, F. E. Westby, J. H. Glenn, Gillan; more O'Grady, J. C. Percy, J. Colohan, J. O'Connor, C. S. Dorley, B. Borrett; hon. treasurer, Walter Seton (re-elected); hon. secretary, E. White (re-elected); club secretary, R. A. Eaton (re-elected).

The Ladies' Automobile Club.—Last week the following ladies were elected to membership of this club:—Mrs. Albert Cay, Miss Florence Chaplin, Lady Farquhar, Mrs. R. A. Hadfield, Mrs. E. Hore, Mrs. Mackenzie, Miss Mitchell, the Hon. Mrs. Alan W. Heber Percy. The committee of the Ladies' Club, Brighton, have invited the members of the L.A.C. to become honorary members of that club when the motor trials take place in Brighton in July. Members of the club who desire to avail themselves of this invitation are requested to communicate with the secretary, Miss Hollingshead, The Ladies' Club, 27, King's Road, Brighton, stating that they are members of the L.A.C.

North-East Lancashire A.C.—The annual meeting of the club was held on Thursday, the 2nd inst., at the Old Bull Hotel, Blackburn. Dr. Stevenson was voted to the chair, and Mr. G. D. Walmsley, in reading the report of the hon. secretaries, said that

the club might congratulate themselves on their present financial position. The good feeling which existed between the club and the police was also commented on, and it was also remarked that the committee had made the suggestion that the Lancashire clubs should be combined in a federation. The election of officers resulted in the appointment of Mr. W. Birtwistle, J.P., as president, while Mr. S. Briggs, J.P., Mr. W. Brown, J.P., Mr. A. Cayley, J.P., Mr. W. Garnett, J.P., Col. W. Place, Mr. H. J. Whiteley, M.P., and the Hon. Wm. Brookes were appointed vice-presidents; and Mr. Arthur Birtwistle and Mr. G. D. Walmsley were elected hon. secretary and treasurer. The committee were elected as follows:—Dr. Stephenson (chairman), Dr. Musson, Clitheroe (vice-chairman), Mr. A. L. Marsh, Mr. W. Livesey, Dr. Fox, Mr. Robert Crossley, Mr. H. V. Blake, Mr. A. Hitchon, Mr. Fred Hodgkinson, Mr. E. A. Riley, Mr. J. R. Thompson, Mr. R. Gillibrand, J.P., and Mr. J. A. Walmsley.

The arrangements for the next season are likely to be of a very interesting nature. There will be a hill-climbing contest in May, a 200 miles non-stop run to Carlisle and back (two days) in June, a 100 miles non-stop run to Kendal and back in September, whilst already four invitations have been received for the members to spend afternoons at the residences of Mr. W. Birtwistle, Mr. Fred Hodgkinson, and Mr. E. A. Riley, and from Dr. Stephenson for an afternoon at the seaside.

Northern Motor Manufacturers and Traders.—On Saturday last a meeting of manufacturers of and traders in motor cars, wagons, &c., was held at the Midland Hotel, Manchester, for the purpose of considering the advisability of forming an association under the above title. It was resolved that the association should be formed, and that it should be incorporated as a company, with liability limited by guarantee. The registered offices of the company will be at 37, Cross Street, Manchester.

Scottish Automobile Club (Western Section).—A most successful smoking concert was held in the Banqueting Hall of the Grosvenor Restaurant, Glasgow, on the evening of Monday, 6th inst., when over 200 members of the club and their friends were present, Mr. John Adam, chairman of the section, presiding. An excellent and varied programme was submitted.

Sheffield A.C.—A novel exhibition is being arranged by the club of privately-owned and other motor cars at the Artillery Hall on March 31st and April 1st. It is hoped that this exhibition may lead to the inauguration subsequently of an annual show. A limited space will be set aside for the exhibition of new cars. A special committee has been appointed to deal with the matter, and Mr. F. B. Cawood, of 68, Eyre Street, Sheffield, will act as secretary.

Wolverhampton A.C.—At the last annual general meeting of the club, the treasurer's statement showed expenditure on club rooms of over £368. At the meeting the following officers for the ensuing year were elected:—President, Mr. Edward Lisle; vice-presidents, the Mayor (Councillor R. E. W. Berington), Capt. Burnett, Messrs. J. H. Cooksey, J. Osmond Evans, T. T. Mills, W. G. Owen, T. F. Yound; committee, Mr. T. Cureton (chairman), Messrs. F. C. Bishop, W. H. Evans, T. G. Gatis, H. W. Jenks, H. W. Stroud, T. Lisle, C. E. Perry; hon. treasurer, Mr. G. H. Evans; hon. secretary, Mr. S. R. Rhodes.



"ALCOHOL at the Mansion House" is not exactly an innovation, for there are reasons to believe that alcohol has been seen there before. In its aspects as a fuel, however, its appearance at the City centre would be a novelty, and the fact that on Wednesday the Lord Mayor presided over the conference which has been called to consider alcohol in relation to commercial efficiency, might have been of some general interest. It would appear that the deliberations of the meeting were confined to the effect of alcohol on the population, and the way in which its consumption diminishes the commercial efficiency of the community; but there is

another aspect of the question which it would be well that the City authorities should bear in mind, viz., that grandmotherly attempts to keep the people sober (combined with shortsighted efforts to increase the revenue) have resulted in paralysing a number of industries in which the use of alcohol is a *sine quâ non*. When next a meeting on the subject is held at the Mansion House, we would recommend a slight change of title, and suggest, for example, "the extent to which the restrictions imposed on the use of alcohol as a fuel and for other similar purposes, are hampering industrial development."



Mr. Charles Glidden, who is still going round the world, has been driving through Fiji, and we are enabled to reproduce the above photograph of him in his Napier car, with the King of the Fijians at the wheel, who we are credibly informed bears the euphonious appellation of Ratu Kadavu Levu Roko Tui Taileon. The tonneau, it will be observed, is unoccupied, presumably for the accommodation of His Majesty's extremely elaborate name.

Dogs or Motor Cars, Which ?—Mr. Bernacchi, who was a member of Capt. Scott's Antarctic Expedition, was entertained recently at the National Liberal Club, when he expressed himself very optimistically about the possible discovery of the South Pole, which should be easier, as, unlike the North Pole, it is situated on *terra firma*. He thinks the best way to reach it would be either by the aid of dogs or some kind of motor car. The alternative is somewhat amusing, and it is certainly unexpected news to gather that the travelling is sufficiently smooth in the Antarctic continent to render automobilism possible. Why should not Mr. Bernacchi combine the two methods of locomotion and get the dogs to assist the motor car? It might produce good feeling at home, though perhaps the intelligence would come rather as a shock to Mr. Perkins, of the Canine Defence League.

THE Brighton Town Council have given way in regard to the service of motor omnibuses between Worthing and Brighton, and have sanctioned their running subject to a route other than that along the front being adopted. This latter proviso was adhered to in spite of the fact that it was pointed out that it was ridiculous to veto motor omnibuses whilst traction engines and other public conveyances were permitted to use the road.

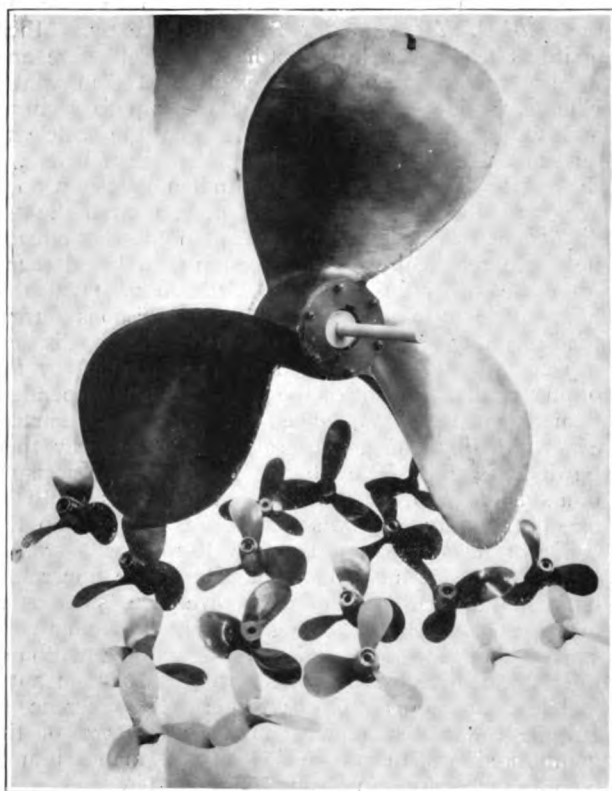
ECHOES of the Indian Reliability Trial are beginning to appear in the Press, and chief among them must be reckoned a most entertaining and descriptive article in the *Pall Mall Gazette* for Saturday recently. Much of it has been covered by what has appeared before, and we are re-introduced to the exquisite Indian winter climate, the ideal air for motoring, the superb scenery, and the magnificent roads. But what the article in question gives us more of than we have seen before, is the extraordinary attitude of the Indian country people. We have already related that in certain out-of-the-way districts of the Dependency the automobile has already been the recipient of actual worship. It would seem, from the writer in the *Pall Mall Gazette*, that this phenomenon also occurred on several occasions during the Reliability Trial. In the more out-of-the-way districts expectation had been raised to a high point by the ordinance that all traffic on the road should be suspended. Something unusual was looked for. But when the actual cars whirled by, the natives salaamed profoundly, then hurriedly touched the earth and brought their arms up in a sweeping movement and joined the hands before the face in the attitude of worship. It was suggestive of the action of the Catholic peasant in Europe who crosses himself to avert an evil omen. But "the uppermost emotion was clearly one of deep reverence, such as is inspired only by a Deva or a god as distinct from an evil spirit." We recommend this attitude to the attention of the notorious Rector of Hurley, who looks upon automobiles as creations of the Evil One. The difference in attitude towards something novel and useful of the "untutored" Indian and the English clergyman is, it must be admitted, greatly in favour of the former.

It appears that in our last issue we attributed to the National Cyclists' Union the Bill which has as a matter of fact been placed before Parliament for a number of years by the Cyclists' Touring Club. We are asked to make this correction, and at the same time we are informed that the National Cyclists' Union has for some time past co-operated with the Cyclists' Touring Club in regard to the proposed Bill, the provisions of which we correctly stated.



Mrs. Glidden, who is also taking part in the round-the-world tour, is shown in the above photograph at Luva, in Fiji, with the proprietress of the Luva Hotel at the wheel of the car.

MOTOR BOATING.



So famous are the Thornycroft propellers, that a large number of them are always going through the shops for motor boat work, as well as for other craft. The Thornycroft Company have recently received an order from a leading French firm, who have entered several boats for the Monaco Races, and our illustration shows these fifteen propellers, alongside the propeller for one of the firm's latest torpedo boat destroyers. It will be remembered that last year the special prize for propellers was secured by the Thornycroft Company, whose screws were fitted to the fastest boat of the meeting, viz., "Tréfle-à-Quatre."

British International Cup.—The length limit of the boats entering for this Cup has been agreed at 12 metres (39'37½ feet), instead of 40 feet, the alteration having been duly approved by Sir Alfred Harmsworth, the donor of the trophy. Amongst those who have formally entered to compete on behalf of Great Britain are two Napier boats by Messrs. S. F. Edge, Ltd., one boat by Messrs. J. E. Hutton, Ltd., and one by Messrs. J. W. Brooke and Co., Ltd.

Calais to Thames Race.—The A.C. de France have decided to finish this cross-Channel race, down to take place on July 15th next, at Ramsgate.

THE Motor Boat Reliability Trials of the A.C.G.B.I. are, it is now announced, to take place in the first week in July.



AN interesting lecture, illustrated with diagrams and photographs, was delivered at Stoke Newington Library Hall, by Mr. Douglas Mackenzie, A.M.I.M.E., on "How the Modern Motor Car Works." Mr. Alderman E. C. Price, J.P., the mayor, presided at the gathering.

MOTOR CYCLING.

Motor Cycling Club.—For the 100 Miles Non-Stop Road Trial for private owners, organised by this club, there will be three prizes, given by Mr. Victor Abraham and the Rev. B. H. Davies. Members of the club when entering must sign the following declaration:—"I propose riding a motor cycle, of which I am the owner, and I hereby declare that I am not in any way connected with the manufacture or sale of motor cycles, and have no pecuniary interest in the success of the machine above mentioned." Saturday afternoon, June 3rd, has been fixed as the date of this event.

The opening run of the club will be to Brighton, on March 25th, members meeting at Purley Corner, starting thence at 3.30 p.m., with a short stop for tea at Crawley.

On May 14th a club run has been arranged in response to the invitation of Mr. Kennard.

In regard to excessive speed, the committee have taken up a strong attitude, and have resolved that the club will not promote any event which shall encourage competitors to exceed the legal limit.

AMONGST the entries for the Motor Cycle Selection Trials for the International Cup, the following have promised to enter one or more machines:—Messrs. Humber and Co., H. Collier and Sons, A. W. Wall, Limited, G. Barnes, and C. B. Frank.

THE inhabitants of Ramsay, Isle of Man, are subscribing for a prize for a motor cycle race on the occasion of these Selection Trials.

THE paper on "Magneto Ignition," which was to have been read before the members of the Auto Cycle Club on Tuesday, March 14th next, by Mr. H. M. Wyatt, has, at that gentleman's request, been postponed until some future date.

A MEETING of representatives of motor cycling clubs, and of the motor cycle sections of cycling and automobile clubs, will be held at the Automobile Club, 119, Piccadilly, W., on Tuesday, March 14th, at 8 p.m., to consider the Auto Cycle Club's affiliation scheme.

THE Auto Cycle Club have decided that any firm entering more than one machine for the Selection Trials for the International Cup Race shall only pay half entrance fees for every machine after the first.

OWING to so few entries having been received for the proposed Light Weight Motor Bicycle Trials, the committee of the Auto Cycle Club have decided to abandon them. A special class for these machines will, however, be included in the 1,000 Miles' Trial to be held in the autumn.

THE Beaumont Motor Club, which has been formed for motorists in the Essex district, have decided to affiliate with the Auto Cycle Club.

THE formation of a motor club open to motor cyclists and automobilists residing in Ilford and the district is proposed to be formed, and with that object a meeting was held last week. Full particulars may be obtained from Mr. R. A. Osman, 1, West Road, Ilford.



IN dealing with the motor 'bus question recently, the Lord Mayor, speaking at the annual meeting of the London General Omnibus Company, stated that he was not convinced that motor omnibuses would bring increased profit, though they *would* solve the problem of London traffic. His Lordship added some very appropriate reflections on the lavish and unprofitable expenditure of the ratepayers' money on municipal tramways, the result of which had been that traffic previously carried by the railways was brought back to the roads, with the consequence that the streets were becoming more and more congested. It is no doubt the recognition of how the authorities have put their foot into it in this respect that occasions a great deal of the bitterness with which the motor 'bus is assailed.

THE London and District Motor 'Bus Company, Limited, is a new company which has been formed, with Mr. A. Campbell Swinton as chairman, to promote public motor omnibus services in the Metropolis.

MR. FREDERICK THORESBY arranged on Friday of this week to read a Paper on "The History and Development of the Motor Car," before the members of the Chartered Institute of Secretaries.

MR. J. T. SALISBURY, Chairman of Messrs. Morgan and Co., Limited, the well-known coach-builders, announced at the general meeting of the company last week, that at the present moment they were constructing motors of their own at their Leighton Buzzard works, and the directors had every reason to expect that they would lead to good results, as they intended to push the motor side of the business as far as was possible.

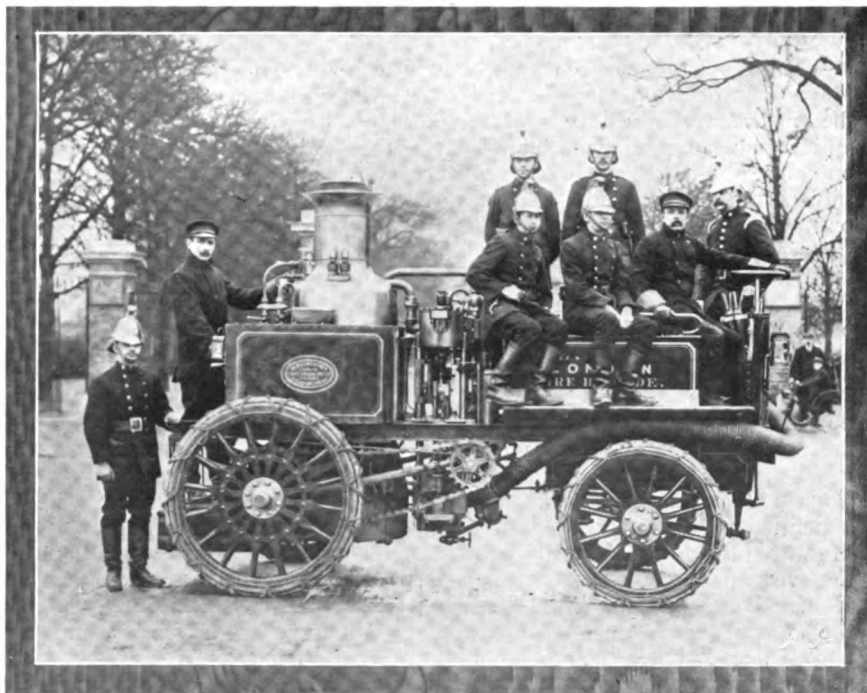
THE Paddington Borough Council have approached Mr. Long, asking him to see a deputation on the subject of the regulations for heavy traffic. Mr. Long does not appear inclined to do so at present, at any rate, and he has replied that he would like to have the views of the Paddington Borough Council and others holding similar views. This is a reasonable attitude, for, as he points out, the draft regulations were sent to all the local authorities, and they have had plenty of time to express their views upon them.

WE learn that Mr. Arthur E. Perman, who is well known to many of our readers, has now been appointed sales manager to Messrs. Legros and Knowles, who are one of the latest British Engineering concerns to take up the manufacture of high-class petrol cars. A few particulars concerning the firm's 20-25-h.p. chassis, which is built at their Willesden works, were given by us in connection with our report of the Olympia Show, on February 18th, and we are giving a full description with illustrations in the immediate future.

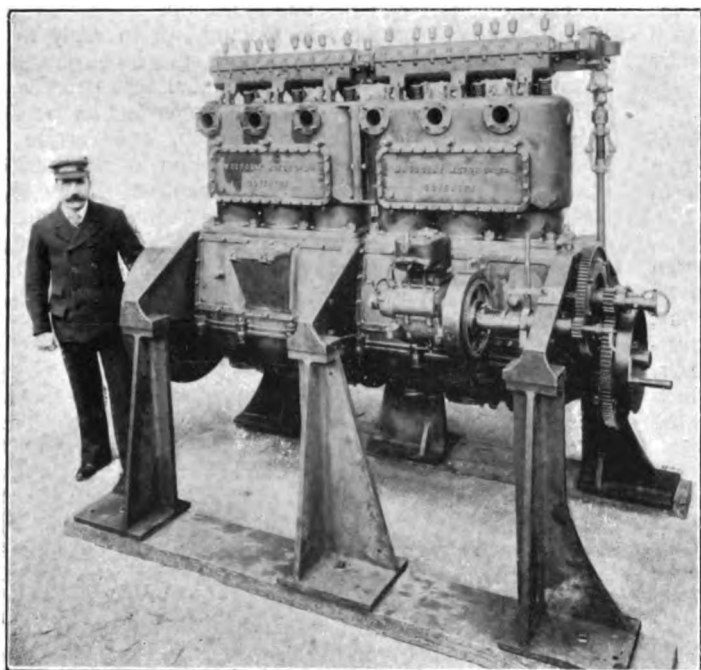
DRIVING certificates are, it has been determined by the A.C.G.B.I., to be issued in the near future. Rules and regulations have been drawn up and are under consideration, and in all probability there will be two classes of certificates, viz., (1) those for owners and others not paid as drivers, and (2) for paid drivers. Class 1 certificates will be valid for three years. Class 2 for one year. In Class 1, upon a holder becoming a paid driver the certificate is to be cancelled automatically, and for inconsiderate driving the certificate may also be forfeited. The certificates for paid drivers are to be granted (a) if the applicant is a competent and careful driver, (b) if he is competent to perform ordinary adjustments and roadside repairs, and (c) if he is of good character. These certificates will be forfeited for misconduct.

THE Iveagh-Pirie scheme does not appear to be making express progress in Ireland, for in reply to a question in the House of Commons, the other day, the Attorney-General for the island stated that practically all that had been done was the organisation by the Midland Great Western Company of one service in County Antrim, and the contemplation of another, it being added that the County Councils of Mayo and Galway had not agreed to incur the expenditure necessary for putting the roads in proper condition for motor traffic, whatever that may mean. It looks as if the scheme so magnificently trumpeted were going to turn out another Galway Harbour fiasco.

ONCE upon a time, it is many years ago now, the four-wheeled hippomobile which blocks the traffic of London and other towns under the name of "growler" (so-called presumably from the expressions of opinion that it evokes on the part of its victims) was known to a not very admiring public as a "fly." Judge Edge, of the Clerkenwell County Court, who, as befitting his name, has been generally sympathetic to the automobile movement, declared, in the case of a witness who recently came before him and described himself as a fly-driver, that "we do not call them flies now, for the very good reason that their progression is the exact opposite of flying." We are reminded of the time-honoured old story from the days when these vehicles were more generally known as flies, and one of them knocked down and seriously injured a foot passenger at Brighton. In the pages of a French newspaper, the information was vouchsafed that across the Channel a man had been knocked down and mangled by "*une mouche*"—the pious ejaculation being added that thank Providence they had no flies (*mouches*) of this description in "*la belle France*."



THE L.C.C. SELF-PROPELLED FIRE ENGINE.—Our illustration represents the latest acquisition of the L.C.C., in the form of one of Messrs. Merryweather's Steam Motor Fire Engines of the "Fire King" type. This machine has a capacity of 500 gallons per minute and is now the most powerful portable steamer in London.



IDEA The 200-h.p. Petrol Engine seen in our illustration has been built by the Maudslay Motor Company, of Coventry, for the General Electric Company of U.S.A., by whom it is to be employed in conjunction with an electric transmission system, for propelling a motor coach on one of the large American railways. This 6-cylinder engine is almost identical in design with the smaller Maudslay models, although its cylinders have a bore and stroke of 9 in., and a normal speed of 600 revs. per min.. As will be seen, it is provided with a small petrol engine (bolted to the crank-chamber) for starting it.

THERE has been trouble in Spain about King Alfonso's motor car. In a district not far from Madrid through which the King has been travelling, a cantankerous Mayor has declared that the King has been breaking the law by travelling above legal speed, by not carrying an identification tablet, and by not paying the tax levied on automobiles. Spanish jurisprudence is one of the subjects on which we are content to plead ignorance, but the idea of a King being amenable to the law in this way would, even in this country with its constitutional safeguards, be looked upon as a little ludicrous. The Crown cannot, according to English notions, be regarded both as the source of our laws, and as subject to them.

THE occasion of the Olympia Exhibition was seized upon by a number of municipal authorities throughout the country to study the question of public motor vehicles, both for passengers and municipal sanitary work. Among the visits paid was one by a deputation appointed to go into this matter by the Conference of Municipal Tramway Authorities. One of the results of the visit paid by the deputation has been that the Halifax Tramways Committee last week recommended the Town Council to obtain, if possible by August next, two Milnes-Daimler petrol omnibuses, each with a seating capacity of 36 passengers. It is considered that by this means several outlying portions of the borough will be able to be served which have hitherto been beyond the reach of the tramcars, and these 'buses are merely intended to be a first instalment should the experiment prove successful.

THE directors of all tramway companies do not apparently think alike. Mr. G. Richardson, the chairman of the North Metropolitan Tramways Company, when presiding at the meeting of the members last week, thought that there was no doubt that motor omnibuses would adversely affect horse omnibuses, as the former would be able to run at a cheaper rate. So far as his company was concerned, the point that would affect them was when they would be able to get a suitable motor car which would run upon the rails. When the proper time came, he said, they would run motor cars on their rails instead of adopting electricity as a motive power.

IN regard to the Royal Marine Artillery Motor Class which has been organised for some considerable time, and the successful examination of whose candidates we refer to editorially this week, one of the officers who has taken great interest in the movement sends us some particulars of the examinations and course of training. The class was started in August last, and has been the result of the generosity and public spirit of the Granada Motor Works at Southsea, who have provided the whole of the instruction for the first class, consisting of fourteen members, all near the completion of their twenty-one years' service. All the members of the class are skilled mechanics, having been previously employed as armourers. The instruction provided has been of an absolutely practical nature, and there can be little doubt that those who have gone through the recent examination so satisfactorily, which, as we state, was conducted by Prof. Vernon Boys, Messrs. R. E. Phillips and W. Worby

Beaumont, will prove most useful servants to automobile owners. The Marine Artillery has appeared in recent years to have had many new departures, and the idea of a horse marine is no longer quite such a contradiction as it once was, for we learn that in the Egyptian Campaign some of the Marine Artillery were actually employed in riding camels; and, as a sergeant-major said in a typical speech: "whether we are riding on camels or entertaining Volunteers, the Marine Artillery try to do their best." A number of officers and local gentlemen have taken great interest in the class and the examination, and cars have been lent for the assistance of the examiners by General Guise Tucker, Major Francis, Lieutenants Ellis and Lane, and Messrs. F. T. Jane and Dudley.

PRECISELY why, when a strong man wants to lift something heavy to show his strength on the stage, he should be disposed to select a motor car for the purpose, is one of those mysteries which it is not easy to fathom. But such is the case. "Auto Atlas," who is doubtless a man of muscle, is performing a feat of this kind, and, poising himself on both arms, lifts up a *bona fide* motor car with three people in it by his teeth. We are not authorised to add that he shakes it, but it is quite possible that he does. The selection of motor cars for such performances may perhaps be looked upon after all as a satisfactory proof of their growing popularity with the masses. Once upon a time, when "growlers" were known as "flies," their appearance on the stage would not have been hailed with enthusiasm.

COMMERCIAL POINTS.

The De Dion Bouton Works.—The motor industry owes so much to the enterprise of this well-known firm that any account of their large factory must be interesting to all motorists, whether users of their cars or not. A charming souvenir, describing the works and the construction of the cars, has reached us from Messrs. De Dion Bouton, of 10, Great Marlborough Street, W., and the illustrations with which this little work is copiously illustrated give a good idea of the magnitude of this old-established French factory.

Motor Clothing.—Among the makers of waterproof clothing the Dunlop Rubber Company have achieved a well-merited success, for they have made every use of the facilities naturally possessed by a large rubber manufactory. Their latest catalogue, just to hand, contains particulars of all the serviceable garments necessary in a motorist's outfit.

Ariel Motor Cycles.—Several improvements have been introduced into the latest Ariel motor cycles, a catalogue of which we have just received, notably in connection with the exhaust valve lifter and the free wheel clutch. The Ariel motor cycles are being supplied from 2 to 3½-h.p. in various grades, while the tricars have 3½-h.p. engines and are supplied in two grades only.

Clincher Motor Tyres.—The 1905 price list of the North British Rubber Company contains much interesting information, including a map of the United Kingdom showing the localities of the various agents where these well-known tyres can be obtained. The catalogue is well arranged, and photographs of each detailed part of the valve are reproduced and given their correct name, a point which facilitates ordering, and largely reduces the chances of misunderstanding.

Solid Motor Car Tyres.—The small catalogue of the Sirdar Rubber Company is always an artistic production, and the colour printing of the various illustrations is this year well up to the usual high standard.

Coventry Chains.—The side-chains of motor cars do not, as a rule, receive very careful attention from motorists, but they should at least be occasionally well washed out with paraffin and soaked in lubricant. A special preparation for this purpose has been put on the market by the Coventry Chain Company, and is reported to give excellent results.

This well-known firm are supplying their chains for use on the new Thames steamboats, and they are also preparing for a big business in connection with heavy vehicle work.

Collier Motor Tyres.—We have received a copy of the 1905 price list issued by the Collier Tyre Company, which gives in a very compact form all the necessary information required by users of these well-known tyres. All the sections are illustrated full size, and very full dimensions are given for the construction of suitable rims. Several useful hints and tips for attaching and detaching the tyres add to the utility of the book, the general get up of which is enhanced by a photograph of the King's 28-h.p. Daimler, fitted with Collier tyres.

REFERRING to the Collier Tyre Company's system of converting wheels free of charge, they write us upon this subject as follows:—"It having come to our knowledge that a rumour is being spread in the trade to the effect that we have discontinued converting 'free of charge' wheels (to take the 'Collier' tyre-rim) which shall have been formerly equipped with other types of rims formed for other tyres, we desire the rumour to be publicly denied, and further do we desire to emphasise the fact that we do still convert any Artillery or wooden wheels to take Collier tyres—as we have been doing during the last two years—entirely 'free of cost' to those automobilists intending to have their cars equipped with this the recognised most successful and reliable pneumatic tyre. All interested should apply to us at 127-130, Long Acre, London, W.C., for particulars of the 'free conversion.'"

Monaco Motor Boat Races.—An unusual opportunity to be present at this very important motor boat meeting in April is offered by a scheme which Mr. Harrington Moore has devised. Mr. Moore has made elaborate arrangements for a large party to visit Monaco, starting on April 7th and remaining until April 16th, after the races have concluded. Under Mr. Moore's guidance the party will travel from London to Monaco under the most comfortable conditions, the headquarters for the period of the races being at the De la Terrasse Hotel. On arrival at Monaco, the steam yacht "Bohemien"

will be entirely at the disposal of those joining the pleasure outing. From this yacht will be witnessed the start of the first race, and she will either follow the racing craft or cruise in the neighbourhood during the whole of the racing period of the week, and when not so engaged will be available for cruising according to the wishes of the holiday makers. The whole scheme promises well, and the remarkable feature of the whole scheme appears to be in the inclusive fee which Mr. Harrington Moore has decided upon, viz., 19 guineas per person. We fancy Mr. Moore's only difficulty will be to keep the number joining the party within reasonable limits.

Cuban Motor Races.—We learn that no less than the first, third, fourth and fifth competitors in the 100 Mile Road Race, which took place recently for the Havana Cup, used "Continental" tyres with square tread and extra strong canvas casing.

IMPORTANT evidence of the increasing interest in automobilism prevailing in Australia is afforded by the fact that Messrs. Charles Jarrott and Letts have recently, as they inform us, shipped to that colony two 22-28-h.p. Crossley cars. Both vehicles have been ordered to be finished in the best possible style, and the body work has been provided by Messrs. Rothschild et Fils, of London, one car having a handsome Roi des Belges body fitted with canopy, the other being a tulip pattern with dark green leather upholstery. This order is a proof of the fact that far from a Colonial demand being merely restricted to light vehicles, the demand for high-class touring vehicles is steadily growing.

M. PELLEGRIN, who was one of the successful contestants in the Seine et Oise Club Reliability Trial on a 6-h.p. De Dion car, has written very enthusiastically in respect to the "Continental" tyres which he used throughout the week. During the entire 1,400 kiloms. he states that he had not the smallest puncture or trouble with the tyres, and this enabled him to take the high rank in the contest which we announced last week he had secured.

MR. MCKINNON WOOD, the well-known member of the London County Council, has just acquired a 4-seated Clement landaulette from Mr. E. H. Lancaster.

LAST autumn the Duke of Buccleuch elected to become an owner of a 28-36-h.p. Daimler car, accommodating about ten people, it being destined mainly for use at his Scottish seat, Langholm. The result has been so surprising to His Grace that he has now determined to add to his motor house one of the latest 30-40-h.p. Daimler cars. This car will be of the standard type with side entrance, giving accommodation for five people. The present 10-seated car will, as before, be kept chiefly for taking parties of friends long distances to the various meets of hounds in Dumfriesshire and neighbourhood.



As showing how difficult it is to find anything new under the sun—even in automobile matters—the above photograph, which we have received from Mr. A. G. Moffatt, of Swansea, is interesting. He points out that the arrangement of the three seats is practically identical with that of the Chambers cars, exhibited by Messrs. Alder and Alford at Olympia. Mr. Moffatt tells us that the photograph was taken in May, 1903, from a car that was then built to his registered design.

At the Edinburgh Exhibition we learn that Continental Tyres were in very strong evidence, and the Company's well-known blue labels were seen on a large majority of the stands.

In Paris, in like manner to London, the increase in the business of United Motor Industries, Limited, has been so rapid that they have had to remove to much larger premises in the French capital. The new address of the Company is now, we learn, 57, Rue Bayen, Paris.

We recorded last week the excellent run of Mr. J. W. Stocks from London to Edinburgh on his De Dion car. In regard to this performance, Mr. Stocks has written to the Dunlop Pneumatic Tyre Company as follows:—"I thought it would interest you to learn that the Dunlop pneumatics (non-slipping 880/120) with which my 15-h.p. De Dion car was shod, carried me through my non-stop journey from London to Edinburgh (400 miles, with plenty of loose metal) without a hitch, and to-day do not look as if they had covered more than 20 miles."



BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I. Mech.E. Thanet House, 232, Strand, W.C.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

27940. 21st December, 1904. Improvements in Steam Generators applicable for Motor Vehicles, Motor Boats, and the like. C. D. GÉRARD, 9, Rue Calomfirescu, Bucharest, Roumania. The invention relates to high pressure steam generators, and has for its object to provide for the rapid circulation of the water, and to obtain a large quantity of dry steam per square unit of heating surface, thus giving the maximum steam power for the smallest possible weight. There are six figures. Figure 1 is a vertical section. Each member of the generator consists of a central body, *m*, of rectangular cross-section, made of steel, bored longitudinally in such a way as to form two parallel chambers, *b*, *b'*, separated by a partition, *a*, with a base, *k* and *k'*, at opposite ends. The ends, *k* and *k'*, have communicating channels, *c* and *c'*. A screw is fitted at *d*, *d'*, for the purpose of attaching screw flanges to close the ends of the

and thence through the channel, *c*, into the upper chamber, *b*, whence it enters the tube, *g'*, through the channel, *c'*, and through the several circulation pipes, *h'*. On its way through the circulation pipes it increases the heat of the feed water, and carries it along in the circulation. A mixture of water and steam then passes through the top chamber, *b*, and the steam separates off into the top tubes, *f*, ascending through the annular spaces, *r*. The steam collects above the water level in the tubes, *f*, and passes down through the tubes, *h*, to the tube, *g*, reaching the steam pipe, *D*, as dry, super-heated steam. The rapid circulation prevents the deposit of scale. March 1st, 1905.

17893. 17th August, 1904. Improvements connected with the Carburettors of Internal Combustion Oil Engines. L. Renault, 139, Rue du Point-du-Jour, Billancourt, Seine, France. The object of this invention is to provide a regulating device, operated by the vacuum produced by the engine in the passage supplying air to the carburettor, instead of by the vacuum created in the carburettor itself. There are three figures. Figure 1 is a section in a central vertical plane. The petrol reservoir, 1, is fitted with a float, so that the nozzle, 2, is supplied at a constant level through two passages, 3 and 4, between which the cone bar, 5, is fitted for stopping the supply of petrol to the nozzle; when required, the engine suction pipe is connected to the outlet, 6, of the mixing-chamber. The mixing-chamber has the central tube, 7, surrounded by an annular space, 8, forming a jacket, through which hot water or exhaust gases circulate to heat the carburettor. The pipe, 9, communicates with the lower part of the chamber, 10, which contains the disc, 11, so arranged in the chamber, 10, as to leave only a small annular space round its periphery, which is about equal in area to

screw in the nut, so that the movement of the disc, 11, rotates the screw, causing the disc to move slowly. The spindle, 12, rests on a support pressed upwards by a spring, 13. On the other end of the spindle, 12, there is a lever, 19, fulcrumed at 20, one end of which controls the cone-valve, 5, by contact with its spindle, 21. A spring, 22, causes the lever, 19, to press constantly on the spindle, 12, but the resistance of the spring, 13, keeps the adjusting screw, 24, normally out of contact with the spindle, 21. The engine draws air only at first round the disc, 11, and the pipe, 9, but successively suction further depresses the disc, 11, and the consequent downward movement of the spindle, 12, operates the hollow piston, 13, admitting more air, and ensuring the constancy of the mixture. If the speed of the engine increases sufficiently the lever, 19, presses the spindle, 21, against the spring, 22, and the valve closes the passage through which the petrol passes to the nozzle. The action of the lever, 19, can be suspended when desired by operating the end, 25. March 1st, 1905.

Patent Specifications Published.

Applied for in 1903.

Published March 9th, 1904.

24,459. R. M. FORD. Horns.

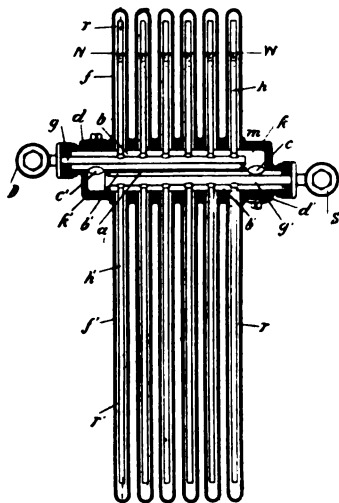
Applied for in 1904.

Published February 16th, 1905.

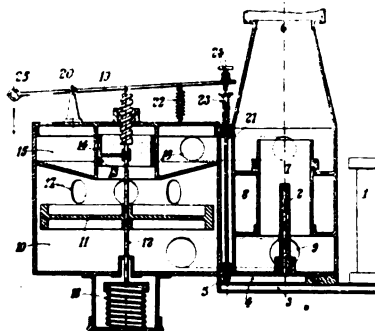
7,139. H. AUSTIN and others. Cooling apparatus.
7,217. F. R. SIMMS. Magneto-electric machines.
7,295. A. E. HALL and H. M. WELLSBORNE. Collapsible framework.
7,384. A. SOAMES and W. LANGDON-DAVIES. Change-speed-gear.
9,183. R. PRICE. Non-skidding solid tyre.
12,206. A. REES. Sparking mechanism.
16,385. F. COURTHOPE. Pneumatic tyres.
24,742. F. R. LORENZ. Feeding and igniting mechanism for motors worked by solid explosive.
26,180. J. SEYKER. Axles.
27,205. H. T. HANSEN. Driving-gear.
7,206. H. T. HANSEN. Driving-gear.
27,445. H. DAVIS. Speedometers.
28,579. H. A. PALMER. Pneumatic tyres.

Published February 23rd, 1905.

2,176. SOC. AUTOMOBILES "HERALD." Carburettors.
2,189. I. N. JACOBS and C. R. GARRARD. Governor.
2,190. I. N. JACOBS and C. R. GARRARD. Governor.
2,269. T. W. BARNER. Sparking plugs.
2,549. S. B. SHELTON. Motor road vehicles.
2,571. H. P. C. HANSEN. Explosion engines.
2,574. V. FILTEAU. Turbine engines.
2,720. F. W. GUNTON. Spring frames.
2,852. H. J. PAYNE. Speed indicator.
7,279. B. G. BATEMAN and others. Duplex frame.
7,357. E. C. F. OTTO. Elastic tyres.
7,527. H. PIERER. Propulsion of motor vehicles.
7,573. L. ARDEN. Silencers.
7,784. C. HAUTIER. Automobiles.
9,772. — MAKES. Controlling air to carburettors.
15,246. E. W. LEWIS and H. SMITH. Friction clutches or brakes.
17,200. — THIERM and — TOWE. Carburettor.
17,574. A. HACKBLOCK and W. H. SCOTTON. Speed-changing-gear.



chambers, *b*, *b'*. Into the body, *m*, a number of tubes, *f*, *f'*, are screwed by means of nipples, and these, after the manner of Field tubes, have their free ends welded or closed. These tubes constitute the heating surface of the boiler, and they are easily interchangeable. In the lower chamber, *b'*, a tube, *g'*, connected with a feed-water pipe or inlet, *S*, is inserted, which does not reach to the bottom, *k'*. The bell-mouthed or expanded end of the tube, *g'*, fits closely against the end of the chamber, *b'*. Circulation pipes, *h'*, branch off from the pipe, *g'*, reaching nearly to the ends of the tubes, *f'*, in which they are concentrically fitted. In the upper chamber, *b*, a tube, *g*, connects with the steam collector or pipe, *D*. It is also concentrically inserted, but is closed at its inner end. From this tube there branch off in the same way pipes, *h*, concentrically fitted in the tubes, *f*. The water enters through the inlet, *S*, and is maintained at about the level shown, *N*, *W*, in the tubes, *f*. When steam is generated a mixture of steam and water ascends through the annular spaces, *r*. It flows into the chamber, *b'*,



the area of the tube, 7, so that the variations of vacuum produced by the engine are transmitted to the disc, 11, which is mounted on the spindle, 12. The spindle, 12, has fixed to it an open piston or shutter, 13, sliding in the cylinder, 14, which is provided with ports or openings covered or uncovered by the piston, 13. The openings communicate between the chamber, 10, and the chamber, 15, which is connected by a pipe, 16, with the mixing-chamber above the nozzle, through which pipe, 16, air is also conveyed to the mixing-chamber. Air enters the chamber, 10, by the port, 17. The upper end of the spindle, 12, is screw threaded, and the thread fits the

The Automotor Journal, March 18th, 1905.

THE AUTOMOTOR JOURNAL

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MARCH 18TH, 1905.

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DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
Mar. 18-25 ...	Cordingley & Co.'s Exhibition (Agricultural Hall).
Mar. 21 ...	Motor Van and Wagon Users' Association Dinner.
Mar. 23 ...	"Motor Mountaineering," by Capt. Deasy.
Mar. 25 ...	Motor Cycling Club Brighton Run.
Apl. 29 or May 1	May Day Parade
May 6 ...	Auto Cycle Club Hill Climb.
May 10-13 ...	Scottish A.C. Reliability Trials.
May 12 or 19 ...	*Quarterly 100 Miles Trials.
May 13 ...	Auto Cycle Club Members' Penalty Run.
May 20 ...	200 Miles Trial (Motor Cycling Club).
May 30 ...	*Gordon-Bennett British Eliminating Trials.
May 31 ...	Auto Cycle Trials and "Selection" Race.
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.)
June 10 ...	London-Edinburgh (Motor Cycling Club).
June 24 ...	100 Miles Passenger Trial (Motor Cycling Club).
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 4-5 ...	*Motor Boat Trials (Southampton).
July 8 ...	Auto Cycle Club Consumption Trial.
July 13 ...	*Hill-Climb (Henry Edmunds Trophy).
July 19-22 ...	*Brighton Speed Races.
July 27-28-29	*Blackpool Motor Meeting.
July ...	24 Hours Run (Motor Cycling Club).
Aug. 11 or 18	*Quarterly 100 Miles Trials.
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 19 ...	*Van Trials, Light and Heavy Vehicles.
Aug. 26 ...	Inter-Team Trial (Motor Cycling Club).
Sept. 9 ...	Brown Cup (Motor Cycling Club).
Sept. 12 ...	Auto Cycle Club Race Meeting.
Sept. 14 ...	*Tourist Trophy (Isle of Man).
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).
Sept. 18-Oct. 3	*Reliability Trials.
Oct. 4 ...	*Speed Trials.
Nov. ...	Society of Motor Manufacturers and Traders Exhibition at Olympia.
Nov. 10 or 17	*Quarterly 100 Miles Trials.

* Automobile Club of Great Britain and Ireland Events and Papers.

Foreign Events (Trials, Races, &c.).

1905.	
Mar. 15-Apl. 9	Copenhagen Exhibition.
Mar. 16-29 ...	Vienna Exhibition.
Mar. 27-Apl. 5	Washington Exhibition.
Apl. 2-16 ...	Monaco Motor Boat Fortnight.
Apl. 14-23 ...	Nice Automobile Week.
Apl. 17 ...	Speed Mile and Kilometre (Nice).
Apl. 18 ...	Coupe de Caters (Nice).
Apl. 20 ...	Coupe Burton (Cannes).
Apl. 20-21 ...	Cannes Motor Boat Meeting.
Apl. 23 ...	Coupe Provinciale (Nice).
May ...	Paris Industrial Vehicles Trials (A.C. France).
May 4-12 ...	Auto Cycle Club de France Tour.
May 11-25 ...	Stockholm Automobile Exhibition.
June ...	French Selection Race for G.B.
June 18 ...	International Motor Cycle Cup.
June 26 ...	Monte Carlo Hill Climb.
July 7 ...	Gordon-Bennett Race.
July 9-22 ...	Ostende Automobile Meeting.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Calais-Ramsgate (Motor Boats).
July 30 ...	Circuit des Ardennes.
Aug. 6-9 ...	Paris-Trouville (Motor Boats).
Aug. 10 ...	Gaston Menier Cup (Motor Boats).
Aug. 10-16 ...	Herkomer and Bleichroder Races.
Aug. 11 ...	Anthony Drexel Cup (Motor Boats).
Aug. 12 ...	International Cup for Motor Boats.
Sept. ...	Brescia Automobile Meeting.

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PASSING EVENTS.

Mr. Long Leaves the L.G.B.

PROBABLY every automobilist in the kingdom will view the transference of the Right Honourable W. H. Long from the Local Government Board to the Chief Secretaryship for Ireland, which he has now accepted, with a very considerable degree of regret. Not originally a motorist himself, Mr. Long has from the first recognised the enormous importance of the automobile movement, and as an enlightened politician has, in consequence, been in general willing to afford it support and assistance. During the time that the 1903 Bill was before Parliament the part played by him in the deliberations of Parliament was characterised by scrupulous fairness, and was, in consequence, distinctly favourable to the automobile movement. As President of the Local Government Board he has from first to last exercised the influence of the office as far as possible in favour of the new locomotion, without in any way behaving as a partisan or over-stepping the limits of the most rigid executive impartiality. Owing to the exigencies of Ministerial re-appointment, Mr. Long, influenced, we believe, rather by loyalty to the Ministry of which he has so long formed an important member, than by personal predilections, has been induced to change the post, the duties of which he has for a long period so brilliantly discharged, for the Chief Secretaryship for Ireland. Our sympathies and those of the large number of well-wishers which, as President of the Local Government Board, Mr. Long has won for himself, will go with him in the change. No appointment under the Crown has proved to be the grave of a larger number of great reputations than the Chief Secretaryship for Ireland. At best, it is an extremely thankless office. Mr. Long has, during his tenure of the post which he has just vacated, given evidences of such great administrative ability, such conspicuous fairness and impartiality, and such tact and good judgment in dealing with the various bodies and the multitudinous questions and problems that have been brought before him, that we trust his future career will prove an exception to the almost universal rule. At any rate, the best wishes of the automobile community will accompany him into his new sphere of activity.

Industrial Motor Vehicles.

FROM one point of view, the growing public interest in the motor 'bus is a most healthy indication of the condition of the automobile industry, as it proves that the public are awakening to the importance of self-propelled traffic for commercial objects, as well as merely for the purposes of pleasure. We have always consistently and persistently maintained from the very commencement of the automobile movement that the pleasure and tourist sides of its development, important as they have proved themselves to be, and will doubtless always remain, will ultimately be eclipsed by the great commercial development which will follow the establishment of the commercial vehicle as a recognised institution. We have never left this point of view out of sight, and from the days when THE AUTOMOTOR JOURNAL first started (some nine years ago) to the present moment, we have devoted a large amount of space (as will be seen from the note that appears on another page) to the commercial vehicle. That the industry generally is now beginning to recognise the truth of this

view, is shown by the large number of commercial vehicles on exhibition at Olympia, and the considerable number which will also be displayed at the approaching Show in the Agricultural Hall. The interest of the moment therefore centres about the commercial vehicle, and we are accordingly devoting a special amount of space in this and subsequent numbers to describing all the recent improvements which have been introduced in these classes of automobile.

All our readers will do well to make themselves familiar with the leading characteristics of the chief types of commercial vehicle. Only such knowledge will put them in a position to decide or assist in deciding, if ever they are called upon to do so, what particular kind of vehicle will suit the requirements of a particular service. With the extent to which commercial vehicles are already being adopted by corporations and public bodies, as well as by private companies and traders, no one can ever tell when it may not be important to him to be able to form an enlightened opinion on the subject. The more such knowledge is diffused the less chance there will be of serious commercial mistakes being made. Because a particular type of vehicle has proved satisfactory for one class of service on a particular line of route, and under special circumstances, it does not necessarily follow that it is suitable for every kind of service that can be imagined. Only knowledge of commercial vehicle construction and the power of discrimination can teach people what systems are likely to prove most satisfactory in any particular case. Above all, this is pre-eminently a subject for consulting engineers, and to them will naturally fall the task very largely of guiding public expenditure in such matters, and to them both the articles which we now commence and which have appeared on similar subjects in our pages in the past, should particularly and specially appeal.

Motor Omnibus Promotions—A Serious Danger.

NEARLY every promising British industry has had the misfortune, as soon as it became promising, and, in some cases, even before the promise had been actually fulfilled, of suffering from the operations of the company promoter, with the result that large amounts of capital have — over and over again — been diverted from channels in which it might usefully and profitably be employed for the advancement of the industry, into the hands of promoters whose chief claims to it lie merely in their being "first in the field." The result has been excitement, inflation, panic, and collapse, and then the industry which has suffered from these operations—in which but too frequently unscrupulous, and almost always non-technical, financiers have marched off with a certain amount of profit—has had to slowly pull itself together, start afresh, and laboriously re-conquer the territory, out of which it has been ousted by these tactics, and which, but for them, it might have possessed completely at a comparatively early date. This was what happened in the case of the electric lighting industry. No sooner had it become apparent that houses could be lighted by electricity on a large scale, without actual loss, than company promoters rushed pell-mell to stake out what was in their eyes a new Eldorado. And the investing public rushed after them. Companies were formed, on a large scale, with large capital (at any rate, on paper), before the conditions of the problems they had to solve were fully understood, and there was loss and disillusionment from which the electric lighting and engineering industry has

gradually had to extricate itself, and from which only recently it has fully recovered. Exactly the same thing happened in the early days of the motor car industry. Scarcely had the automobile been proved a practical possibility, when huge inflated companies were promoted, with the object of establishing monopolies in every class of vehicle for the propulsion of which horses had previously been necessary. The result was to undermine public confidence in the automobile movement for many years, to prevent the solid and sensible investor—who should have been the mainstay and support of the British automobile industry—from having anything to do with it, and, in consequence, to place the motor car industry of this country at a disadvantage, as compared with its foreign competitors, from which it is only now gradually recovering.

♦ ♦ ♦
Festine Lente.

SLOWLY and gradually the motor omnibus has been evolved by prolonged experiment on the part of a few firms (who understand the conditions involved), in co-operation with a few of the more enterprising 'bus companies, who—as the result of experiments, and of the confidence engendered by one or two types of vehicle which have been supplied to them, had determined gradually to introduce the motor 'bus. This is the way the movement ought to take place—the gradual introduction of approved models under the management of companies which have already shown themselves competent to deal with traffic on a large scale. It is the *festine lente* of the old proverb, which so generally means the most continuous and uninterrupted progress in the long run. Under these circumstances everything looked promising and satisfactory. Motor omnibuses would have been introduced to the public in the Metropolis under competent management, and the machines adopted, and the reputation of the firms that built them would have ensured practical success.

♦ ♦ ♦
The Entry of the Promoter.

THIS was the general aspect of the situation, and the prevailing happy state of affairs, until a few weeks ago. Then the daily Press, at any rate a portion of it—headed by the papers which have always taken a great interest in the automobile movement, and have systematically displayed their willingness to do all they can to benefit it—commenced to sing the praises of the motor 'bus. It was its many merits, as the natural and more pleasing competitor of the electric tram, that first, we believe, directed this attention to it. The more the daily Press devoted attention to the motor 'bus, the more enthusiastic they became about it, till the number of laudatory articles appearing on the subject almost looked as if a regular "boom" was being engineered. But we do not see any reason to conclude that this was really the case. It is quite probable that the attitude of the Press was quite unprejudiced, and merely the result of more closely examining the question. The amount of general interest and enthusiasm, however, on the subject became very considerable, and that it had a financial value was clearly felt. The result has been that, following the launching of a motor omnibus company recently, we have, within the past week, seen the issue of two more new companies with immense share capitals, amounting to over half a million sterling, designed to exploit the supposed Eldorado which the motor 'bus movement throws open to the investing public, whilst, from rumours which are about, there are numberless other creations ready for issue.

Caution for the Sake of the Movement.

Now, we wish to see the motor 'bus movement as prosperous as possible, and have always done our best to contribute to this end, for its success is closely bound up with, and will certainly assist, automobile progress generally. Apart from more direct considerations, commercial failure and fiasco in one such important branch of the industry could not fail to have a depressing effect on all other branches. The motor 'bus has, even under the most favourable circumstances, to contend with various hostile influences—that of the electric tram being by no means the least. We are convinced that the reckless issue of heavily capitalised motor 'bus companies is fraught with very grave danger indeed. In the first place, the new companies will be, in nearly all cases, new organisations. Their position will be altogether different from that of large existing omnibus companies in London, gradually replacing, as they feel their way, the horse 'bus by the motor 'bus. Management, organisation, knowledge of routes, and all the experience which goes to the successful management of concerns of the kind, will all have to be learnt. In addition they will have to learn how to manage motor omnibuses, and then they will have to find the motor 'buses. The estimate of probable profits, on which these promotions appeal to the public, are based on regular running, on absence of the keen competition that is being so freely courted, and on running, at practically full load, of a large number of 'buses. Where will they get them from? The few makers whose 'buses have been proved to be capable of running successfully are full up with orders already. They have as much and more than they can do to provide vehicles for existing 'bus companies like the London General Omnibus Company, the Road Car Company, and Messrs. Tilling. The result will be, therefore, that many of the 'buses will in all probability have to be provided by practically untried firms. And if the result is that the routes on which they commence their operations are strewn with the disintegrated remains of their vehicles to an extent suggestive to the casual onlooker of General Kuropatkin's *sauve qui peut* from Mukden, we, at any rate, will certainly not be surprised. Even if they can procure the number of 'buses estimated for, do the promoters imagine that they can at a wave of the financial wand obtain the necessary drivers? If they think about a matter of this kind for a moment they will see that it is impossible. But probably they do not think, and, least of all, do they want the investing public to think. For the vice of company promoting—the formation of companies designed to exploit a suddenly created popular belief in the wealth to be culled from some new industrial development—is that they do not necessarily depend upon successful commercial working, and too often their first organisers and promoters seem to adopt the motto *après nous le déluge*. "Get the companies floated, and what happens after that doesn't worry us."

In the name of the automobile movement, now at last in this country overcoming its initial difficulties, the prejudices which it has had to encounter, the difficulties of procuring adequate capitalisation which it has had to surmount, on behalf of the travelling public which desires to enjoy the benefits of cheap self-propelled 'bus locomotion, and in the interests of the possible guileless investor, we protest against the whole business. If carried out on anything like the lines indicated, it is practically certain to have but one result—fiasco, and the postponement of the day, when the motor 'bus will become a universal and justly-popular institution, by many months, and probably years.

For their own sakes, therefore, not less than for the sake of the automobile movement, we would advise the investing public to approach companies of the class to which we alluded, with the very greatest caution. The establishment of a large number of companies or even (at present) of a few large companies pledged to place a large number of motor 'buses in operation in London at the earliest possible date, will, as we have pointed out above, be productive of the greatest possible danger to that branch of the movement, under existing conditions, and the greater the number of such companies that are floated, at any rate at the present moment, the worse things will be. Investors who rashly rush to take up their issues will be all helping to kill the goose that should provide the golden eggs, before she has begun to lay.

A "Spook" Inset.

IN what we have said above on the question of highly capitalised, newly formed, motor 'bus companies, we have discussed the whole situation on general grounds, and on these grounds we have cautioned the public to consider very seriously the pros and cons of the whole situation before becoming investors. As regards the case of one of the issues now before them, however, more particular comment seems to be called for, as the loosest methods appear to have been adopted to render the issue attractive to the public. We refer to the "phenomena" accompanying the issue of one of the prospectuses. The *Daily Mail*, which has throughout taken a great interest in the motor 'bus movement, recently published somewhat enthusiastic articles, in which certain data of a roseate character concerning the profits obtainable by running motor 'buses were attributed to Mr. H. Tilling, of Thomas Tilling, Limited. A report of this article appears somehow to have got into *some* (we are not told how many) of the prospectuses of one of the companies appealing to the public. This had no sooner taken place than Mr. Tilling himself wrote as follows in regard to these figures attributed to him:—

"These figures are altogether misleading, as the gross earnings of the motor omnibuses are quoted without reference to expenses, and in the case of the horse omnibus the net earnings only are given. After six months' experience of working motor omnibuses in London, in which we had no competition with either motor or horsed omnibuses, I can safely say that the figures given are wrong."

At the same time the *Daily Mail* declared that the article referred to could be in no way taken "as indicating to the public the desirability of supporting individual promotions." The secretary (pro tem.) of the new 'bus company immediately declared that this article had been sent out as an inset with some of the prospectuses of this company *without the directors' knowledge, and without their sanction*, and continued as follows:—

"My Board desire to notify that any persons proposing to subscribe for shares in the London and District Motor 'Bus Company, Limited, will do so without regard to the statements contained in the extract in question as purporting to have been made by Mr. Tilling or otherwise."

The extract does not appear in the official prospectus as advertised in the daily and other newspapers, and none of the statements or figures appearing in the prospectus are based upon information contained in the extract in question."

The question, therefore, arises, by whose authority were these reprints inserted in the prospectuses? Comment on such a proceeding is needless, and could have no other effect than to spoil the impression it is calculated to make in all its unadorned simplicity.

A Year of Useful Activity.

THE Motor Union of Great Britain and Ireland has published its annual report for 1904, and the report is certainly calculated to convince even the most casual reader of it of the very considerable advantages which result from membership of the Union. Most familiar to the motoring public, of course, is what we may term the legal activity of the Association; that is to say, the extent to which it has been instrumental in assisting motorists to resist the oftentimes frivolous, and more frequently disingenuous, attempts to persecute them, to which they have frequently been subjected by repressive application of the machinery of the 1903 Act. The Union are very proud of their year's activity in this respect, particularly as regards their successful appeals on important points, both to the Divisional Court and to Quarter Sessions. These successful appeals, all of which have been chronicled in *THE AUTOMOTOR JOURNAL* at the time, have established the principle—a most important one to motorists—that where an automobilist is summoned for driving to the danger of the public, such danger must be not merely asserted but *proved*. Altogether, by uniting motorists and combining the resources, individually small but collectively formidable, which they possess, for the purposes of combating prejudice and the unfair use of existing statutes, the Motor Union has by its work, particularly during the past year, done an enormous amount to improve the general position both of the individual motorist and the automobile industry. It should also be remembered by all automobilists who do not at present belong to the Union, that not only is advice on legal and other subjects provided gratis for members, but that actual financial assistance is often also rendered.

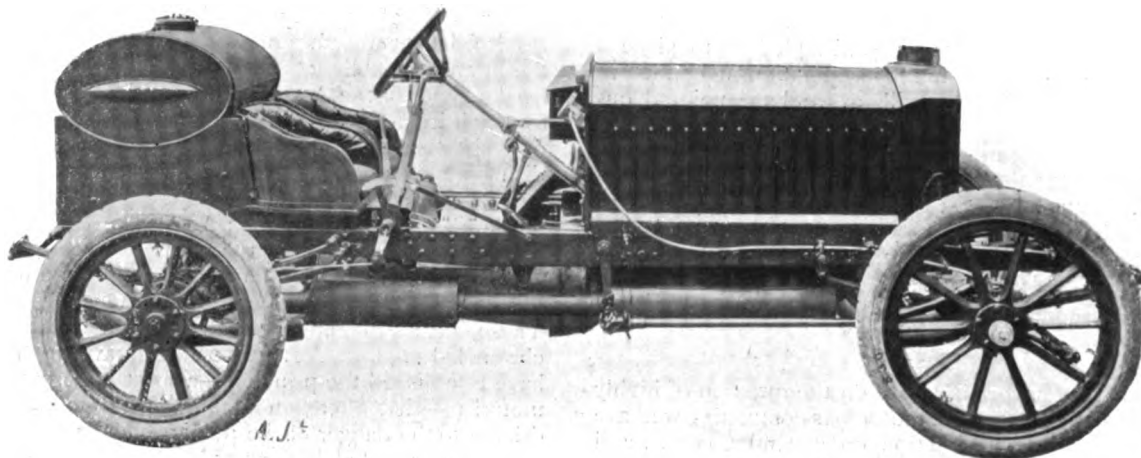
The Union also does, and is still doing, good work in promoting and supporting legislation beneficial to automobilists, obtaining general information for touring purposes, and in various other ways, so that as the annual subscription is only one guinea, the advantages provided are an admirable money's worth. That this fact is generally recognised is proved by the large membership of the Union, which now amounts to 7,500.

WE referred in a recent issue to the letter of Mr. Johnson on behalf of the British Empire Motor 'Trades' Alliance, in which he observed that the administration of the A.C.G.B.I. and the Society of Motor Manufacturers and Traders was, to some extent, in the hands of gentlemen who have large interests in the sale of foreign cars in England, and, therefore, cannot be looked upon as bodies which would see after the purely British manufacturers' interests. This statement naturally attracted the notice of those bodies, and at a meeting of the A.C.G.B.I. club committee last week, the subject became the topic of some discussion. It appears from the actual figures that 32 members of the club committee are entirely private members, and that of the remaining 18, 14 are as much interested commercially in British cars as in cars of foreign build. Mr. Johnson explained to the committee that the distinction he meant to draw between the Automobile Club of France and the A.C.G.B.I. was that the French Club existed to protect French interests at the expense of foreign interests, but that he did not mean to suggest that the British Club neglected the interests of British manufacturers. It was finally resolved—

That this committee has received with satisfaction the statement from Mr. Johnson that he did not intend to imply that the administration of the club was controlled by members interested in foreign cars.

RACER

GORDON-BENNETT RACERS FOR 1905.—MR. J. HARGREAVES' 80-H.P. NAPIER.



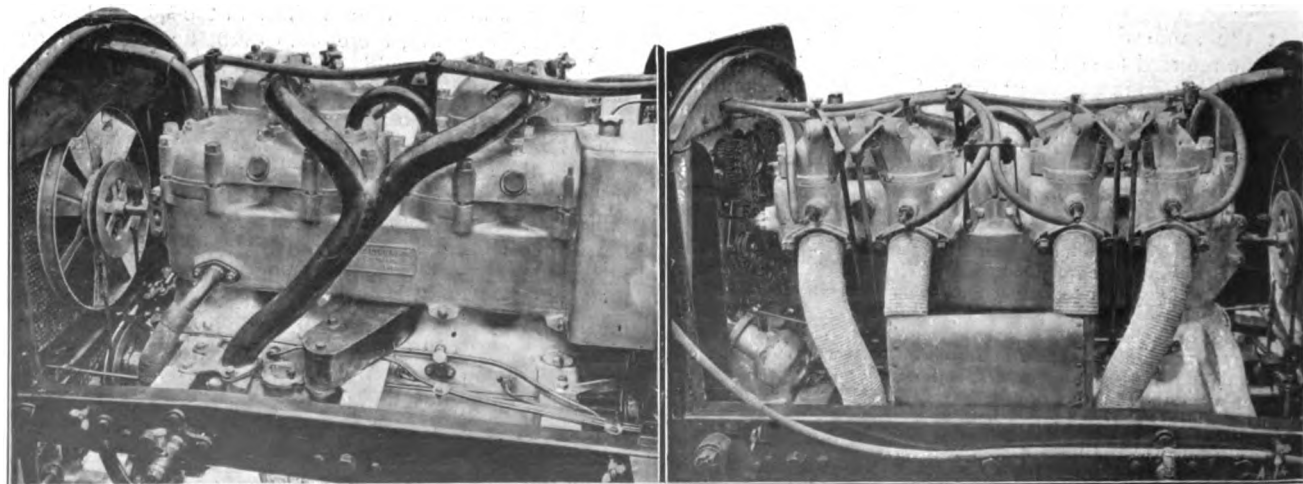
Side view of Mr. J. Hargreaves' 80-h.p. Napier Racer, which is entered for the Gordon-Bennett Eliminating Trials.

THE first of the new Napier Gordon-Bennett racing cars for 1905 has already been completed and is now in the hands of its owner, Mr. J. Hargreaves, who was, it will be remembered, a competitor in the Isle of Man Eliminating Trials last year, and was chosen by the committee as first reserve to the British team. In general construction the car resembles that driven by Mr. S. F. Edge in the last Gordon-Bennett Race, and its appearance and leading features are very clearly shown in the accompanying photographs, which we were able, through the courtesy of Mr. S. F. Edge, to take of the car just before it left the famous Napier works.

The car is of the live-axle type, having a four-cylinder engine capable of developing about 80-h.p., and a gear-box of the sliding spur-wheel type, giving three forward speeds and a reverse, with a direct-through drive from the engine to the axle on the top speed. The frame is of pressed nickel steel, and is carried on semi-elliptic springs, which lie outside the side members both in front and at the rear. The leaves of the springs are clamped at intervals by small side-plates in order to prevent

excessive motion, and keep the leaves in position. The rear springs are fitted with shackles at both ends, and hinged side radius-rods tie the back-axle-casing to the frame. The steering is of the usual Napier pattern, but the connecting-rod from the lever-arm is bent to pass over the front axle in order to join the steering knuckle in front. The tie-rod also lies in front of the axle.

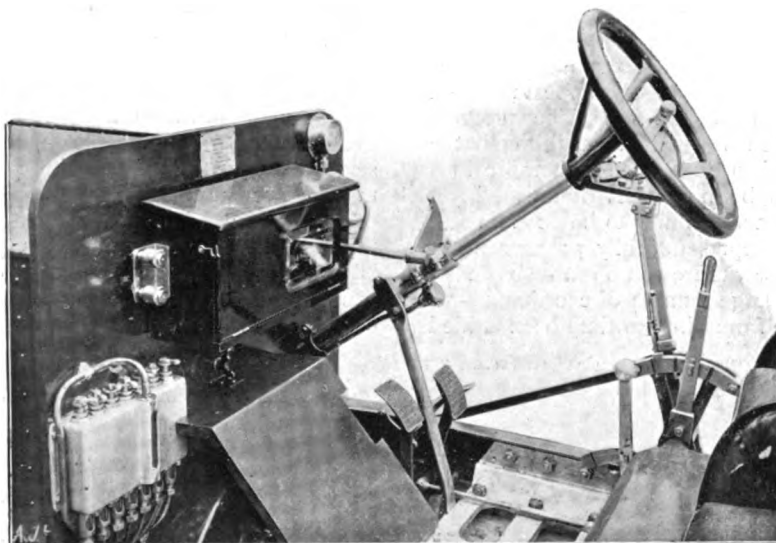
The engine is carried directly across between the side members of the main frame, and the cylinders—the bore and stroke of which is $6\frac{1}{2}$ ins. by 6 ins. respectively—are formed by cast-iron liners which are forced into a single aluminium casting also forming the water jacket. The heads of the cylinders are, however, cast in pairs. The mechanically-operated inlet-valves lie above the exhaust-valves, and are operated from the same cam-shaft by inclined push-rods and rock-shafts, which are fitted with adjustable tappets. In order to get a good distribution of the weight, the engine lies well behind the front axle, and even the radiator, which is of the honeycomb type, does not project in front of this member. The top of the radiator forms a large water tank, which extends a



Views, from either side, of the 80-h.p. engine fitted to Mr. J. Hargreaves' Napier Racer. The left-hand illustration shows the position of the carburettor. The intake pipe for the warm air passes between the middle cylinders, from a large box—visible in the right-hand illustration—which partly surrounds two of the exhaust pipes.

little way under the bonnet, and the radiation is assisted by a belt-driven fan placed immediately behind the tubes. The cooling water is circulated by a large centrifugal pump, which is chain-driven, adjustment for the drive being provided for by mounting the pump on slotted brackets and fitting a flexible connection to the circulating pipes. The well-known Napier synchronised ignition system is fitted to the dash, the commutator being, as usual, chain driven. The throttle lever is fitted to the centre of the steering wheel, and is of the same type as that fitted to the Napier touring vehicles. A centrifugal governor is fitted to act on the throttle valve, and an accelerator pedal is also provided.

The clutch is of the internal cone type, and has metal-to-metal friction surfaces, the faces are held in engagement by three external helical springs, each of which is

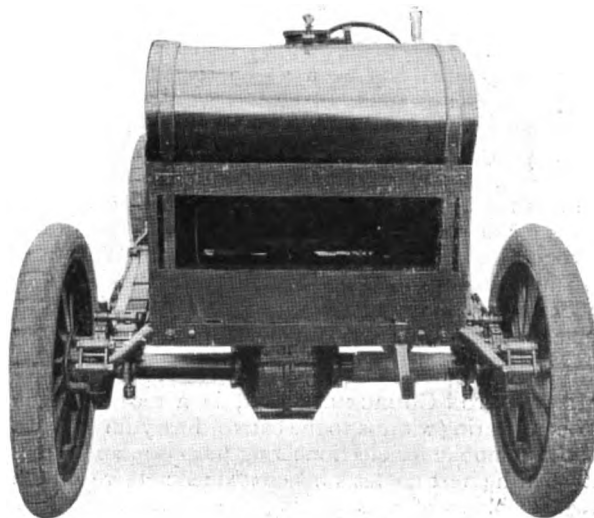
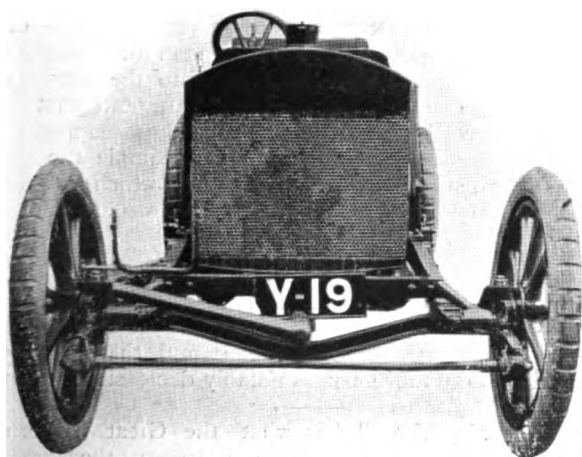


View of the pedals and levers on Mr. J. Hargreaves' 80-h.p. Napier Racer. The top of the gear-box forms part of the "floorboard."

easily adjustable. The gear-box is carried from the side members of the frame, and provides three forward speeds and a reverse, with a direct-drive on the top speed. The propeller-shaft is enclosed throughout its length by an aluminium casing, which also serves as a torque rod, and between the front end of the propeller shaft-casing and the gear-box is a band-brake operated by one of the foot-pedals. Band-brakes, operated by a side lever, are also fitted to the rear-wheels, and these are compensated by

a wire cable.

The car has been made as light as is possible, consistent with strength, and the crank-shaft, as also one of the gear-shafts, is hollow. The wheel-base measures 8 ft. 10½ ins., and the track 4 ft. 7 ins., the rear-wheels are shod with 850 mm. × 120 mm. Dunlop tyres, while the front wheels have tyres of 870 mm. × 90 mm.



Front and rear views of Mr. J. Hargreaves' 80-h.p. Napier Racer. Part of the rear axle has been bound with asbestos cord to protect it from the exhaust gases.

The Automobile Club.—The Club has been exceedingly fortunate in securing for the coming year so influential a chairman as the Hon. Arthur Stanley, M.P., who has consented to act and has been elected to that office in place of Colonel Holden, who, to the great regret of everybody, did not offer himself for re-election. Dr. Boverton Redwood, D.Sc., Mr. Alfred F. Bird, and Mr. Robert Todd have been elected vice-chairmen. During the time which Colonel Holden has

held the office of chairman he has devoted an immense amount of time, as also conspicuous ability, to the conduct of its affairs, while his unfailing tact and sound judgment have enabled him to perform a number of important services for the development of the industry and the pastime. Colonel Holden's retirement, we understand, is solely due to the fact that he has found it impossible to continue to combine his official duties with the serious demands made upon his time by the business of the club.

THE NEW 35-H.P. BROOKE CAR.

It is hardly credible, when visiting the works of Messrs. Brooke and Co., at Lowestoft, to realise that it is only three years since their first car made its public appearance—at the speed trials then held at Cromer. The progress they have made has been so great that although the premises have been added to, and although their previous engineering business has by no means diminished, yet every available inch of space has now to be economised, and their motor business represents fully 75 per cent. of their total output. The works are run on most business-like and efficient lines, a large number of excellent up-to-date machine tools have from time to time been added

we are chiefly concerned now with the new 35-h.p. car, that is their latest model, the first finished chassis for which will form one of the chief attractions at the Agricultural Hall Show. It and their 15-20 car of last year are the two standard types this season, and the new vehicle has several features that constitute departures from the makers' previous practice. The engine has four cylinders of 5½-in. bore and 6-in. stroke, and is capable of developing about 50-b.h.p. at 1,000 revs. per min. The clutch is of a special metal-to-metal type, having an internal expanding member, and the change-speed-gear—instead of having chains and jaw-clutches as before—is of the

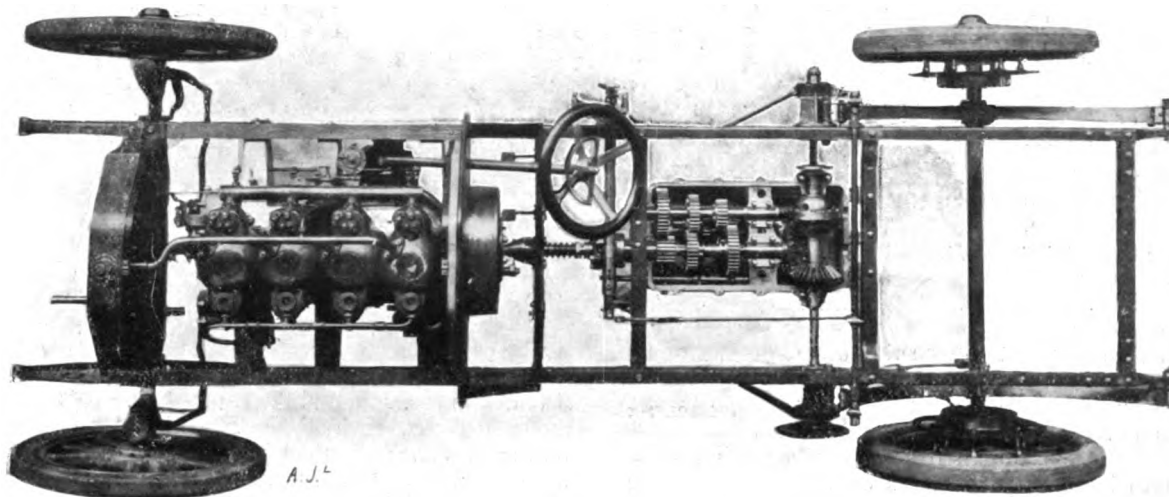


Fig. 1.—View of the 35-h.p. Brooke Chassis, from above.

to the plant, and the jig system, which was from the first wisely adopted, has been so consistently improved that the interchangeability of every part is ensured.

Being so favourably located for the purpose, and being in such close touch with the yachting and shipping world, a considerable amount of attention has naturally been bestowed by them on the development of petrol engines for marine work, and this now forms, as is well known, an important part of their business. With their latest motor boats, however—and we were able to carefully examine "Baby II," prior to being despatched to Monaco—we must deal separately in another article, for

sliding-spur-wheel type. Other interesting characteristics of the new car are that a low-tension magneto type of ignition has been adopted, that Hoffmann ball-bearings are fitted to the road-wheels, as well as to the bearings supporting the ends of the countershaft, and that a somewhat novel system of engine-control is employed. The entire chassis, moreover, is of very simple though strong design, and there are other features which will be described in detail in the full description we are about to give.

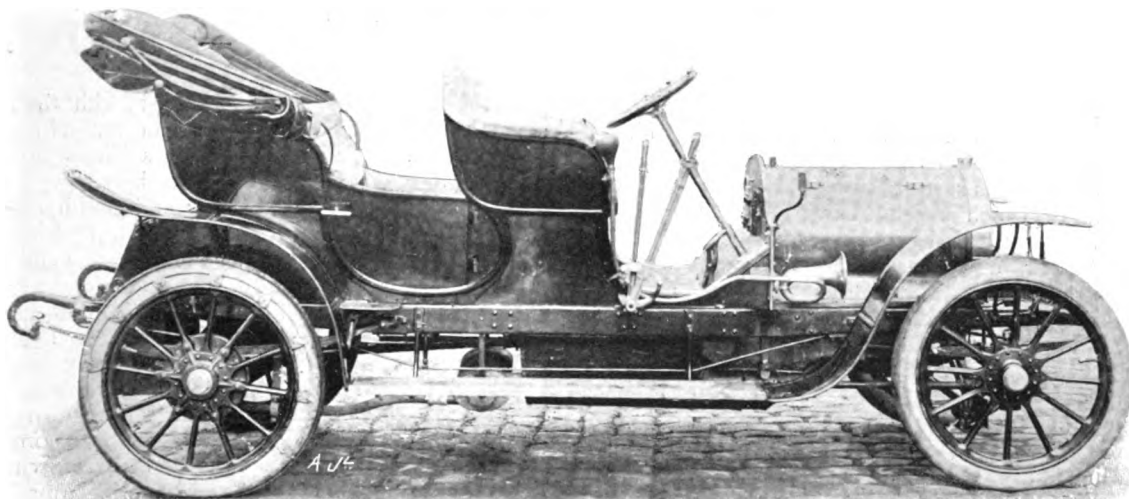
(To be continued.)

MR. WINSTON CHURCHILL, M.P., in a recent speech has been bearing witness to the extraordinary importance of the automobile for electioneering purposes, and hopes that when he next contests his constituency there will be a regular block of cars placing themselves at his disposal. Mr. Churchill is optimistic as regards the future of the automobile movement, and appears to think that it will not be long before we find the 30-h.p. hearse and the 24-h.p. "Black Maria" familiar objects in our streets. 30-h.p. engines have usually been associated with speed and from that point of view their application to a hearse seems inappropriate. Whether motor transport would be appreciated by the inmates of the "Black Maria" is one of those points on which we prefer not to dogmatise. Mr. Churchill then touched the real focus of the present situation. Observing that some five years ago a motor car was an object of derision if it stopped for a moment, he added "now the horses have got used to them, and the asses have got used to them." That is the real point.

The asses have got used to them, and that is why opposition to the movement is notably decreasing.

Painting the Map Red is what the Great Western Railway Company are doing, that is to say, they have published a map of the West of England served by their lines, showing the routes on which they have organised a motor omnibus service to feed their stations, and also the lines on which they run rail motor services. The number of these services is quite surprising, amounting in all to some 44 distinct routes, of which some 27 are road motor 'bus lines. The Great Western Railway are, as most people know, a most enterprising undertaking, and are always on the look out for the most up-to-date methods of improving the attractiveness of their system, the animating spirit being well illustrated in another direction by the manner in which they are adopting some of the most recent and scientific improvements in electric carriage lighting.

THE 1905 HOTCHKISS CARS.—PART I.



A 17-25-h.p. Hotchkiss Car fitted with side entrance body.

ALTHOUGH it was only at the Paris Salon of 1903 that the Hotchkiss cars made their first public appearance, yet they very quickly took their position in the front rank of first-class cars, and the new models, for which the London and Parisian Motor Company (Captain Corbet) have the sole English agency, show—in every respect—that attention to detail and careful construction which is naturally to be expected in the products of this famous French gun factory. Two models are being built for 1905, and as these differ only in dimensions, the description which we give of the 17-25-h.p. type will apply, in the main, to the larger 30-45-h.p. car also.

The car is of the live-axle type, is fitted with a 4-cylinder engine, and has a gear box of the sliding spur-wheel type, giving three speeds and a reverse with a direct drive on the top speed. Nickel steel has been largely used in the construction of the chassis, and no castings have been employed except where necessary. Considerable attention has been given to the protection

of all working parts, while, at the same time, they are rendered as accessible as possible for inspection. Although, in many respects, the present type has undergone some modification, compared with that of last year, yet the most striking feature of the Hotchkiss cars—namely, the use of ball bearings on the crank-shaft—is still retained, the manufacturers considering that their successful use during the past season is sufficient justification for continuing this same unusual method of construction. The steering heads, however, this year follow more usual practice, the previous type—described in our issue of January 9th, 1904—having been abandoned owing to the difficulties of proper lubrication. The transverse spring at the rear has also been dispensed with. One of the special features on the new Hotchkiss cars is the gear-box—special precautions having been taken to render it oil-tight; and the low-tension igniter-tappet mechanism is another interesting detail.

(To be continued.)

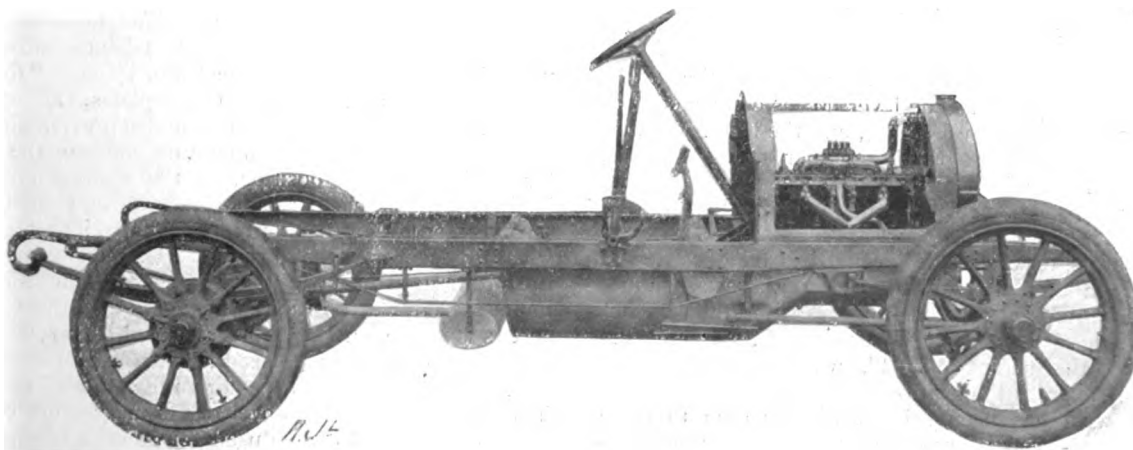


Fig. 1.—Side view of the 17-25-h.p. Hotchkiss Chassis, showing the trussed frame, and the metal sheeting under the gear-box.

THE 20-H.P. BROTHERHOOD

PETROL CAR.—PART VII.

OWING to the very unusual and interesting arrangement of the change-speed-lever, B^2 , we give a number of illustrations that will enable its action to be clearly understood. In Fig. 30, it is seen from the back of the chassis, the full width of which is visible, and here the lever is placed in its neutral position, with the hinged handle projecting straight upwards. In Figs. 31 and 32 it is shown from the side of the car, in its "reverse" and in its neutral positions, respectively, while in Fig. 33, it is once more shown from behind, but, in this case, it lies in the "fourth" speed position. Supplementing these

photographic views, the construction of the lever is clearly shown by line drawings in Fig. 34, which includes side and end elevations, in addition to a plan view. The lever itself is fixed to a sleeve that is mounted freely about the cross-tube, E^1 —which passes across the frame and is fixed to the brake-lever, E —while on either side of it there are two spring arms, M and M^1 , that project up from two other sleeves, which are also mounted about the rock-tube, E^1 . The three sleeves are concentric with one another, and the two spring-arms, M and M^1 , are respectively connected by their sleeves with

the two lever arms, M^2 and M^3 , that operate the sliding wheels in the gear-box. The lever, M^3 , is connected with the lever, B^2 (shown in Fig. 27), and the lever, M^2 , with the other lever, B^{10} , so that the inner spring-arm, M^1 , controls the "first" and "second" speeds, and the other spring-arm, M , controls the "third" and "fourth" speeds.

The sleeve to which the lever, B^2 , is fixed carries, at its other end, an arm, M^1 , which—in a special manner that will be referred to later—engages with the lever, M^4 , seen in Figs. 30 and 33. The lever, M^5 , is connected direct to the sliding-rod, B^{11} , which introduces the "reverse" gear, in the gear-box.

From what has been said, it will be seen that the change-speed-lever is capable, under certain circumstances, of introducing the "reverse" gear if it is rocked about the cross-tube, E^1 , but that in order to control the "first" and the "second," or the "third" and the "fourth"

speeds, it must either be rendered rigid with the spring-arm, M^1 , or with the other spring-arm, M . Normally it is free from both of them, and these arms then lock themselves in their neutral positions by resting in slots in the side-plates, M^6 , of the quadrant, but either of them can—when the lever itself is in its neutral position—be forced out of its slot, and be forced into a slot in the side of the lever itself instead, this being done by one or other of the sliding wedges, M^7 , which are carried by the lever. The two wedges, M^7 , are connected by rods with the pivoted handle at the top of the lever, but

are both normally so held that they do not come into contact with the spring-arms, M and M^1 , because the handle is held in its upright position by the two helical-springs, M^8 . It will thus be seen that either of the wedges, M^7 , can be forced down, and made to render either of the spring-arms, M and M^1 , rigid with the lever, and free of the quadrant, by merely pressing the pivoted-handle over in the one direction or the other about its fulcrum, and that it is then only necessary to move the entire lever forwards or backwards over its central quadrant, M^9 , in order to introduce either the

"first" and "second" or the "third" and "fourth" gears, respectively. The two side-plates, M^6 , of the quadrant have slots, M^{10} , cut in them that prevent either of the wedges, M^7 , from being moved, except when the handle is in its central position, for the wedges have projecting portions that normally lie above the level of the quadrant, and they can only pass down into the slots when the lever is in that position. This arrangement has the additional advantages that the pivoted-handle is held in its tipped-over position, when either of the forward speeds is in use, and that the handle thus serves as an indicator to show which speed is actually in use.

It will be noticed, from the illustrations, that the hand-lever only moves over the front portion of the upper quadrant, M^9 , when used for giving any of the forward speeds, and that the slots, M^{10} , in the quadrant-plates, M^6 , do not allow it to move rearwardly to more than a certain extent, when the handle is tipped over-

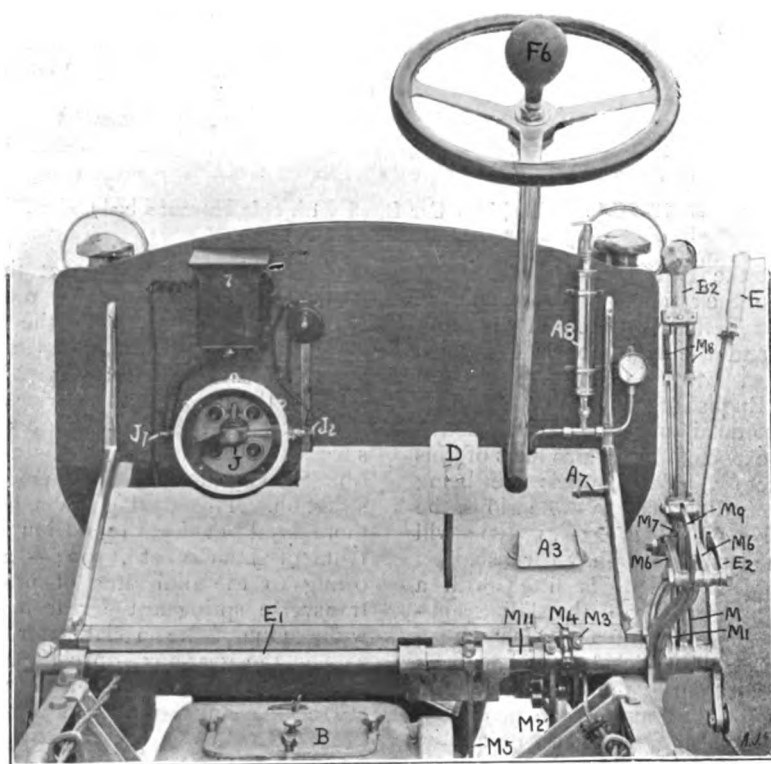
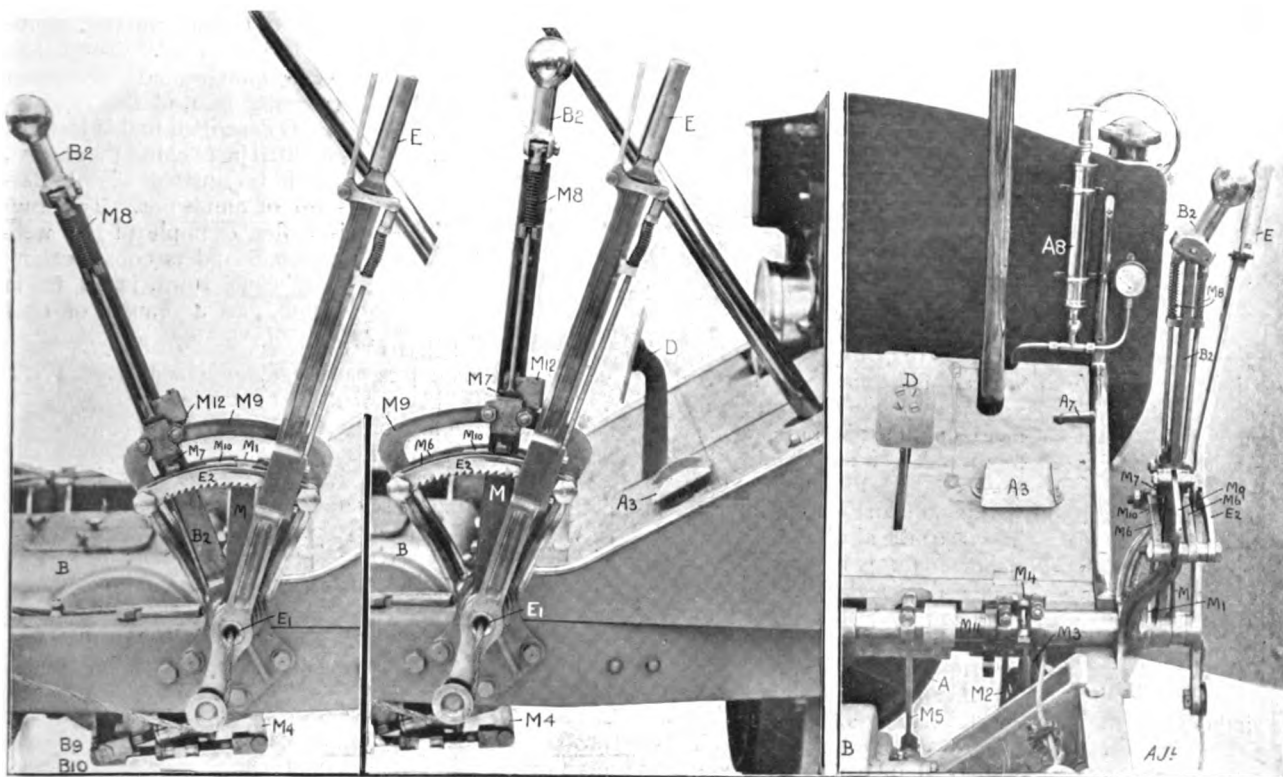


FIG. 30.—View of the Regulating Levers and Pedals on the Brotherhood Car, showing the Change-speed-lever in its "Neutral" position.

When, however, the handle is upright, the lever can be moved back to the extreme end of the quadrant, M^9 , and in doing so it introduces the "reverse" gear. This result is obtained by a mechanical connection—of which the sleeve, M^{11} , forms a part—between the lever-arms, M^4 and M^8 (see Figs. 30 and 33), that allows of a certain amount of "lost motion" between those lever-arms, so that the former only begins to move the latter when the hand-lever, B^2 , is nearing the end of its backward range of travel. Provision is made by the spring-catch, M^{12} , and a slot in the quadrant, M^9 , for retaining the hand-lever in its neutral position, but the spring-catch is unable to prevent it from being moved by hand. Not only are the two spring arms, M and M^1 , normally locked in their neutral positions—so that the gears controlled by them are unable to move—but an ingenious locking

The hand-lever normally stands in the position shown in Fig. 32, and its handle can then be tipped over in either direction. If rocked over to the left and then pressed forward, it gives the "first" speed, and, if the same inward pressure is exerted upon the handle while it is pulled backwards, the "second" speed wheels will then be brought into mesh. To get to the "third" speed, an outward pressure is required on the handle, and the lever is once more pressed forward as far as it will go, for then the pivoted handle will rock over, as soon as the neutral position is reached, and the other spring-arm, M , will be carried forward with hand-lever instead. To obtain the "fourth" speed, the outward pressure is still kept on the handle, and the lever is drawn fully back; it then occupies the position seen in Fig. 33. In Fig. 31 it is shown in the "reverse" position, the handle having been



FIGS. 31, 32, AND 33.—Views showing the Change-speed-lever in its "Reverse," "Neutral," and "Fourth-speed" positions, respectively.

device is also fitted to the mechanism controlling the "reverse," and a similar effect is thus obtained for it.

allowed to remain upright, and the lever having been drawn back to the extreme end of the quadrant, M^9 .

(To be concluded.)



Olympia November Show.—Since the determination was arrived at to hold the next show of the Society of Motor Manufacturers and Traders at Olympia in November next, all arrangements to that end have been pushed forward as strenuously as possible. Alterations which will very largely increase the available space at the command of the organisers will be carried out at the earliest moment, and a scheme is being elaborated by which the best central positions will be allotted for the most interesting exhibits, both British and foreign, and whereby duplication of types will be avoided. The membership of the Society continues to increase, this being particularly noticeable amongst manufacturers of motor boats.

Most people will sympathise with Major Seely in his objections raised in Parliament to the introduction of a new instrument of torture on certain automobiles. The contrivance, which is called a "motor syren," is said to produce a blast of horror something midway between a railway whistle and a fog-horn. It may be true, as claimed, that it clears all dogs out of the way and diminishes the chances of accident to pedestrians by inducing the latter to bury their heads as deep as they can in the nearest ploughed field. But such an abomination motorists have no right to inflict upon other members of the community, and if its adoption becomes at all general it will mean the revivifying of the opposition which is fortunately now dying out.

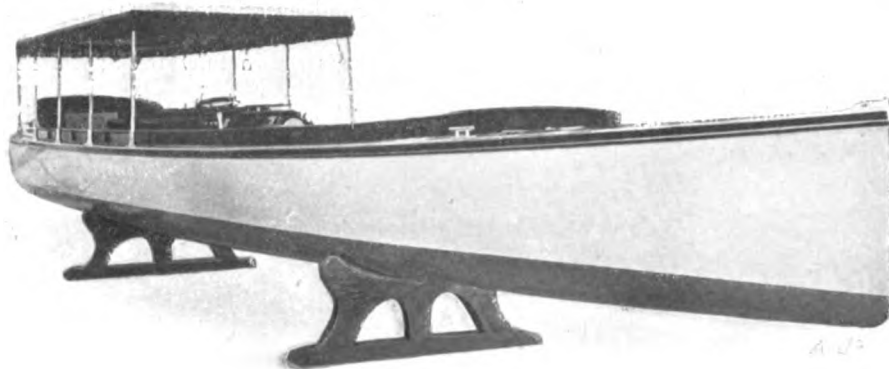
THE OLYMPIA EXHIBITION OF 1905.

(Concluded from page 315.)

THE MOTOR BOATS.

ONE of the characteristics which serves to stamp the Olympia Exhibition as the most representative show of its kind yet held is, undoubtedly, the completeness of the motor boat section. For the first time this

Olympia, were to be found boats of very various powers and descriptions, ranging from the open boat propelled by the diminutive $2\frac{1}{2}$ -h.p. Seal motor to the 40-ft. torpedo launch fitted with 120-h.p. Thornycroft engine, and including a river launch shown by S. F. Edge, Limited, which was a picture of neatness with its awning and green leather upholstery. This river launch is fitted with a 10-h.p. Napier engine, having its four cylinders cast in pairs, and the valve-gear arranged in a similar manner to that on the engine of the 40-h.p. car. A metal-to-metal clutch and a Napier reversing gear, of the type recently described in this journal, are fitted just behind the engine, which is situated slightly forward of amidships. The hull is a fine example of the well-known Saunders construction; it is triple sewn, is 40 ft. in length, has a draught of only



AT OLYMPIA.—The Napier River Launch, which has a 10-h.p. 4-cylinder engine.

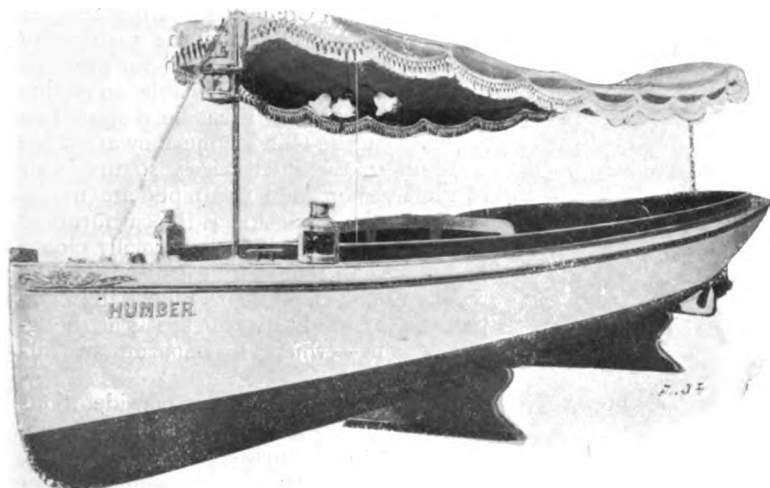


AT OLYMPIA.—Two views of the Thornycroft Marine Exhibit, showing the 40-ft. Torpedo Boat, which has a 4-cylinder 120-h.p. engine with 8 in. by 8 in. cylinders.

part of an automobile show attracted an amount of general attention which compared favourably with that evinced in the cars themselves, and for the first time, too, this section may be said to have really deserved it. There was a time, not so very long ago, when any sort of engine in any kind of hull did duty for a motor boat. Now, this important industry receives the close attention of naval architects, and the engines of the best makers are specially designed for the class of work which they are called upon to do. It is true that the exhibits did not include any reversible petrol engines, nor any suction-producer plants for marine work, but at



AT OLYMPIA.—The 30-ft. Wolseley River Launch, which is fitted with one of their twin-cylinder, 12-h.p., vertical engines.



AT OLYMPIA.—The 30-ft. Milham River Launch, fitted with a 10-h.p. 4-cylinder Humber engine, and a reversing-gear of the friction type.

1 ft. 1 in., and makes, it is said, a wash of only 3 ins. at its normal speed of 12 miles an hour. The shallow draught necessitates a "tunnel" stern, and the hull aft is therefore made concave to receive the propeller. In spite of the fact that the hull is 40 ft. long, and has seating accommodation for 11 persons, yet the total weight is, we hear, under 26 cwt.

The Thornycroft torpedo launch, already mentioned, has been built for experimental purposes, and, if successful, it is not unlikely to prove the prototype of a class of boat which will find considerable use in our navy. The engines are capable of developing 120-h.p. at 900 revs. per min., and the four cylinders, which are cast in pairs, have an 8-in. bore and an 8-in. stroke. The total weight of the engine is 25 cwt., which gives $23\frac{1}{2}$ lbs. per h.p. All the valves are placed on the port side, so that large inspection-doors can be fitted on the other side of the crank-chamber. The engine is placed well forward and lies under a turtle deck, out of which projects a funnel for the exhaust.

For starting, an air reservoir is fitted, and this is charged to a pressure of 75 lbs. per sq. in. by a small Brotherhood compressor, driven by an independent 6-h.p. petrol motor. Reversing is effected by an epicyclic gear. The hull is of steel and lap riveted, the draught is 2 ft. 7 ins. forward, but the bottom sweeps up almost to the water line aft. The overall length is 40 ft., and the beam is 6 ft. 2 ins. The displacement is estimated at about $4\frac{1}{2}$ tons, and, although not yet tested, she is expected to make about 8 knots. Besides this exhibit, Messrs. Thornycroft also showed a 25-ft. launch, fitted with a 20-h.p. 4-cylinder engine, the hull being built on the Saunders' principle, and one of their 82-h.p. 6-cylinder marine sets, as well as other engines.

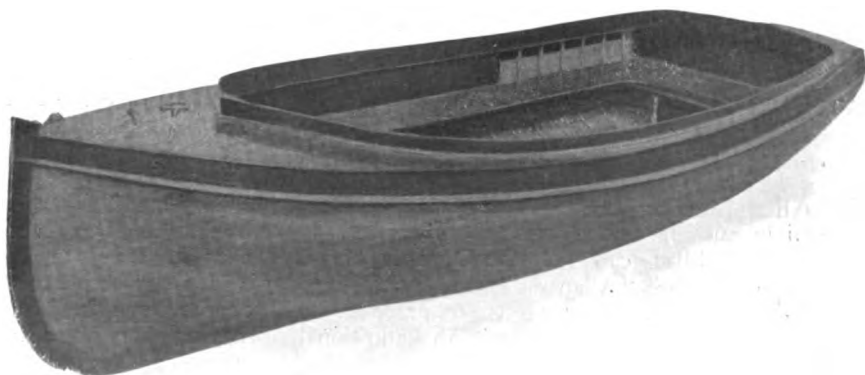
One of the boats which must have appealed to the pockets of a large number of visitors was Messrs. Brooke

and Co.'s remarkably cheap little 15-footer, which we recently described in detail. There should be a large demand for a little boat like this, for practically anyone who may even have only occasional use for a skiff, can well afford to possess such a handy little craft. A more powerful boat, exhibited on the same stand, was the 18-ft. carvel built hull fitted with a 14-h.p. 3-cylinder Brooke engine. This boat has a 4 ft. 10 ins. beam, and a draught of about 18 ins.; the engine is very accessible, and has all its valves and pipe fittings on the port side. A Meisner reversing propeller is fitted, instead of a reversing gear. One of the most interesting features of Messrs. Brooke's stall was the half-model of "Baby II," mounted alongside a similar model of last year's well-known "Baby." The lines of the two boats differ considerably, and the firm anticipate exceptionally good results from the new boat during the coming season.

An interesting exhibit was "La Coquette," a 35-ft. cabin launch, shown by Messrs. J. S. Hutton and designed by Linton Hope and Co. The Panhard engine, to which reference has already been made, is fitted with the Chenier Lion vaporiser for using naphthaline. Messrs. Perman and Co. showed another cabin launch of comfortable proportions, and, in addition, one of the Delahaye marine sets. These engines are peculiar from the manner in which the crank-chamber is hinged to allow access to the main bearings. On this stand, also, was a launch built by Messrs. Pitre et Cie., one of the most noted of the French constructors, who have been represented in the numerous racing events of the past season.

The Wolseley Company showed a 30-ft. open launch fitted with a 12-h.p. twin-cylinder vertical engine, and this firm also exhibited a 60-h.p. marine set, as well as a large 6-cylinder crank-shaft.

Several other firms showed finished boats, and engines exhibited separately, while others exhibited only marine sets in various sizes. Among the engines were the well-known Blake marine motors, shown in the 18-24-h.p. and 25-35-h.p. sizes; the Clift engine, which is of somewhat peculiar construction, for which great accessibility is claimed; the Fay and Bowen two-stroke engine; the Lozier motor, which is of much the same



AT OLYMPIA.—The Petrol Motor Boat, shown by the Seal Motor Company, the engine for which is of their special type, having a short-stroke, inverted cylinder, beneath, instead of above, the crank-shaft.



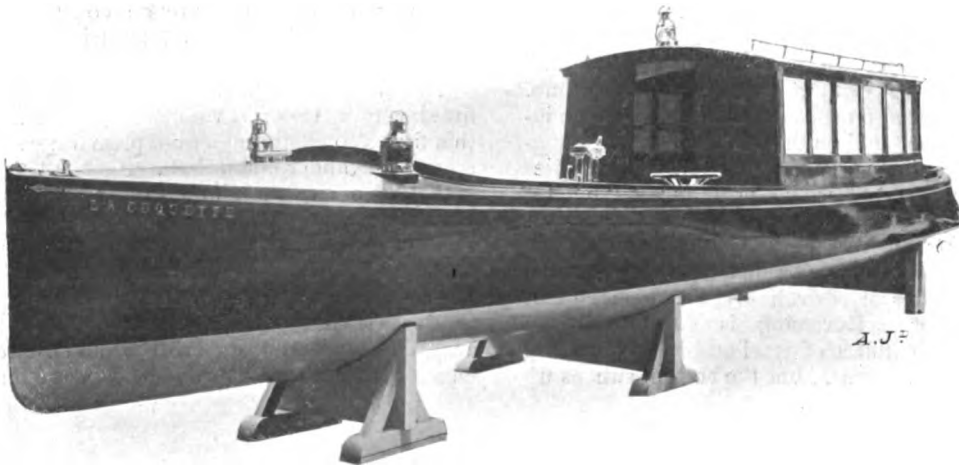
AT OLYMPIA.—The Petrol Motor Boats shown by the Stirling Launch Company.

type; and the well-made Gardner kerosene engine. The 30-h.p. Clift marine motor, shown by the Kensington Motor Boat Company, has a four-cylinder engine, and each cylinder is cast separately, with a bore and stroke of $4\frac{1}{2}$ ins. and 5 ins., respectively. The valves are placed in the heads of the cylinders, and are mechanically operated from a gear-driven cam-shaft, which passes across the top of the engine and also drives the high-tension magneto at the aft end. One of the features of this engine is the use

of a separate "Cremorne" carburettor for each cylinder; the Cremorne carburettor is, it will be remembered, from our previous descriptions, designed to enable an engine to use kerosene after it has been started on petrol. On the Clift engine, they are fitted close up to the inlet-valves, so that only extremely short induction pipes are necessary. On the same side as the carburettors are half-compression ports normally closed by a special plug fitting which may be readily removed, either to relieve the compression, or to observe the spark at the ignition plug—which is opposite to this port.

One of the most important considerations in connection with the motor boat is undoubtedly the means provided for going astern. Reversible propellers find favour with many makers, and, of these, the Gaines and the Meisner are perhaps the best known examples. Several interesting reversing gears were to be seen at the show, notably the Napier—which has

already been described in these columns—the Blake, which obtains its reverse in a very simple manner from two lay-shafts, carrying intermeshing gear-wheels and a system of jaw-clutches, and the Neptune, which also has a positive arrangement of gears with jaw-clutches. In other cases, an epicyclic gear, operated by a band-brake, is held as a reverse mechanism, while on the Milham boat, fitted with Humber engines, the "reverse" is obtained by means of friction cones.



AT OLYMPIA.—The 35-ft. Hutton Launch, which was built to the design of Messrs. Linton Hope and Company, and is fitted with a 10-h.p. 4-cylinder Panhard engine.



The Allen Steering Lock.—A somewhat peculiar, and certainly novel, device was shown fitted to one of the Cadillac cars, at the Olympia Show. It is known as the "Allan steering lock," and is intended, primarily, to act as a preventative against skidding. It consists of an additional wheel that is fixed rigidly to the steering-pillar, immediately beneath the steering wheel, so that it at all times remains stationary, and can be gripped simultaneously with the steering wheel. It is said that it has been found in practice to greatly reduce all risks of

side-slip, and that it is only necessary for the driver to hold the two wheels tightly together (with his hands) immediately any tendency to skid becomes evident. Whether this fixed wheel only gives confidence, or whether a fixed support of this kind facilitates the manipulation of the steering-wheel, under exceptionally trying conditions, it is, of course, impossible to say without having actually tested the device, but it may well be that there is some advantage in having it fitted, and—so far as we can see—there are, at any rate, no disadvantages to it. There is, of course, no *mechanical* lock

THE BRADLEY MULTIPLE-DISC CLUTCH.

(Concluded.)

THE driven member, B, has the large flange, C D, formed at its inner end, but it otherwise has a smooth cylindrical surface, upon which rides a second flanged portion, J K, that is compelled by feather keys to revolve with it. The flange, J K, constitutes the chief part of the sliding member of the clutch, and is normally forced outwards against the sleeves, H and H², by the internal coiled spring, E. The sleeves, H and H², however—which do not revolve—have cam-faces arranged between them, and they are prevented from sliding off the end of the inner member, B, by the threaded collar, H⁴, which can be locked in any position by the screw, H⁵. The two sleeves, H and H², have ball thrust-bearings arranged, as seen, and

through holes in all twelve discs, C¹², and they also serve as guides for those discs to slide upon. It will be noticed, however, that there are thirty more pins, C³⁰, which form the principal guides for the discs, C¹², and that these are carried between the flange, C D, and the casting, C¹, in just the same way that the pins, A³⁰, are carried between the castings, A¹ and A². The discs, C¹², therefore have thirty-six guide-pins in all, of which thirty are fixed, and the remaining six slide longitudinally in order to draw the ring, J², up against the discs.

The second function of the flanges, C D and J K, is to separate the discs, C¹², and to hold them firmly, at equal distances apart, along their guide-pins, when the

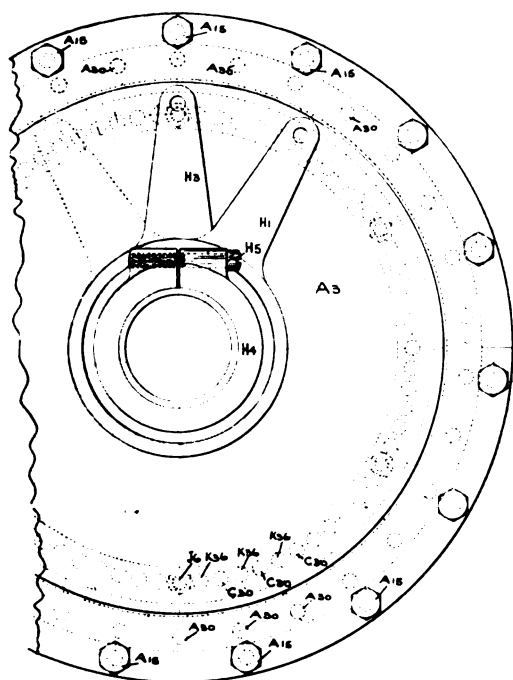


Fig. 2.—Drawings showing the Bradley Multiple-Disc Clutch, in end elevation and in section. In the main section, the clutch is shown with its discs engaging one another, and in the corresponding part sections (to the right) the discs are shown separated. In the two upper sections, the "engaging" mechanism is emphasized, and, in the two lower sections, the "separating" device is rendered especially prominent.

they both have projecting lever-arms—H¹ and H³, respectively—the one of which is connected with the frame of the car, and the other with the clutch-pedal. It will thus be seen that when the clutch-pedal is depressed, the sleeve, H², forces the sleeve, H, against the flange, J K, moving it towards the flange, C D, against the action of the spring, E.

The first function of the clutch is to enable the spring, E, to press the discs, C¹², together, so that they grip the discs, A¹³, between them. This, it will be noticed, has to be done when the flange, J K, is being moved away from the flange, C D, in spite of the fact that the discs have to be made to slide in the opposite direction. For this reason a kind of "scissor" action is necessary, and this is provided by the casting, C¹—which connects the flange, C D, with the far side of the discs—and by the ring, J²—which is connected by the six studs, J⁶, with the flange, J K, in a similar manner. The studs, J⁶, pass

flange, J K, is forced inwardly towards the flange, C D. For this purpose the flange, C D, is fitted with three equally spaced stop-pins, D³⁶, for each of the twelve discs, C¹². These stop-pins are of just such lengths that the discs, C¹², come up into contact with their ends when the discs are separated correctly. It must be understood that the ring, J², is drilled with thirty-six holes for the stop-pins, D³⁶, to pass through, and the requisite holes are also drilled in the discs to allow each stop-pin to pass through all intermediate discs that lie between it and the particular disc that it controls. Thus it will be seen that the disc nearest to the engine will have thirty-three holes drilled through it, to allow the stop-pins, D³⁶, for the other discs to pass through it, that the next disc will in the same way have thirty holes for this same purpose, and so on.

The sliding flange, J K, is similarly fitted with thirty-six separating-pins—three for each disc—and these pins

E

pass through holes in the casting, C^1 , and holes in some of the discs, in just the same way as has already been explained in connection with the stop-pins, D^{36} . The two upper cross-sections in Fig. 2 will enable this action to be clearly understood, but it is also very clearly demonstrated in the central view of the lower part of Fig. 1, where each of the stop-pins or each of the separating-pins are seen to pass through the single disc, C^{12} —the only disc that is in place—with the exception of those marked D^{36} and K^{36} , respectively, which are actually holding this disc firmly between them. Naturally, the stop-pins and the separating-pins are of different lengths for the different discs, and this fact is well demonstrated in the view immediately to the right of that to which we have just referred.

By the ingenious construction just described, it will be seen that the separating-pins, K^{36} , retreat at the same time that the clutch-spring, E , forces the discs up together, and that they thus do not interfere in any way with the primary function of the clutch. The actual pressure, moreover, of the spring upon the discs is not fully applied

of the inner member, as well as its diameter, should be reduced as far as possible, because otherwise it acts as a flywheel on the gear-shaft, and necessitates the provision (on the car) of brake-blocks to retard it when changing to a higher speed; the momentum of the gear-shaft can, in fact, be reduced to advantage on all cars that are apt to fall into the hands of inexperienced drivers.

The design shown in Fig. 3 obviates both these possible drawbacks, for not only is the clutch altogether smaller, but—in one sense—it has been practically turned inside out—that is to say, the operating mechanism is fitted to the outer member instead of to the inner member. Its action, however, is so precisely similar, that, in our illustration, we have been able to employ the same reference letters as those used in Figs. 1 and 2, for the corresponding parts. In this case, the crank-shaft, A , has a spigot that projects inside the gear-shaft, F , and the inner member, B , is securely fixed to the gear-shaft. The fly-wheel, A^1 , is built up, in conjunction with the casting, A^2 , and with the oil-retaining casing, A^3 , in the manner

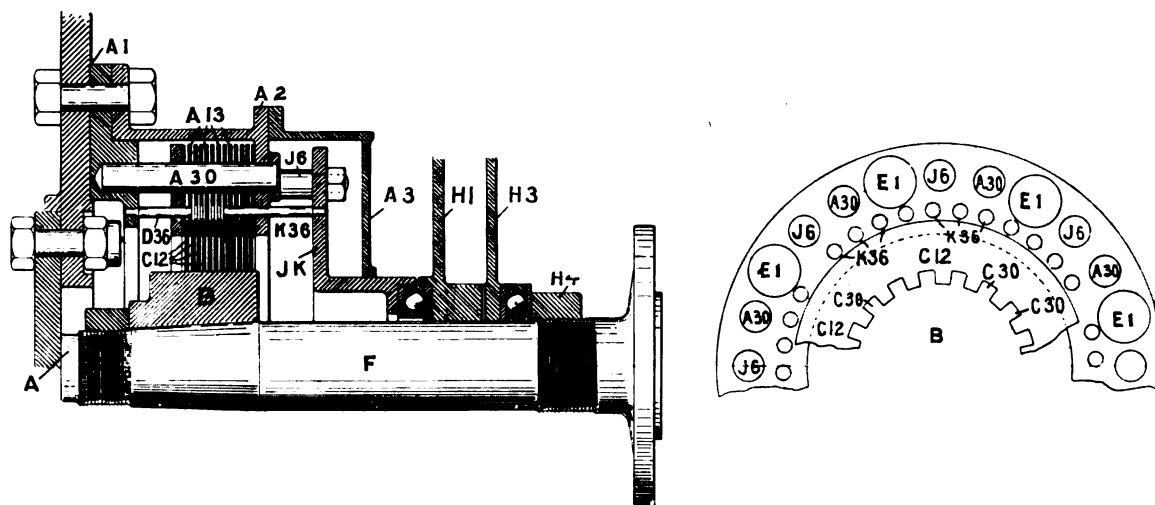


Fig. 3.—Longitudinal vertical section, showing another form of the Bradley Multiple-Disc Clutch, in which the overall dimensions, and the weight of the inner member, have been considerably reduced. To the right, are part sections of the Discs.

until they are all in contact with one another, and then it is that the oil between the discs, A^{13} and C^{12} , is gradually squeezed out until sufficient grip has been obtained between them. The more slip that there is, the more tendency is there for the oil to be "wiped" off, but it is quite impossible for them to grip suddenly. It will also be noticed that when the clutch is disengaged, the pressure is first relieved between the ring, J^2 , and the casting, C^1 , after which each disc, C^{12} , in turn—commencing with that nearest the engine—is moved along towards the engine by its separating pins, K^{36} , until they have all been forced up against their stop-pins, D^{36} , and are firmly held there. Each of the discs, D^{36} , of course, carries one of the discs, A^{13} , along with it.

The actual form of clutch, that we have just described, is only one pattern of several, that have been devised by the inventor for various types of petrol car. In some cases, the overall dimensions of the clutch can, to great advantage, be reduced, in order that there may be sufficient room between it and the rim of the flywheel to introduce fan-blades, as on Mercedes or other cars. In other cases, also, it is highly desirable that the weight

shown, and the "driving" discs, A^{13} , are free to slide upon the guide-pins, A^{30} . The "driven" discs, C^{12} , are slotted internally, and—instead of riding upon guide-pins—they fit over longitudinal projections, C^{30} , that form a part of the driven member, B . The discs, A^{13} , are normally forced up tightly together by eight springs (instead of a central spring) that pass right through the holes, E^1 , in them, and always tend to push the flange, $J K$, away from the casting, A^1 . This flange, $J K$, acts on a ring, J^2 , through the pins, J^6 , in just the same way as before, and the clutch also has its stop-pins, D^{36} , and its separating-pins, K^{36} , fitted as in the previous design. The same form of operating levers, H^1 and H^2 , are used for disengaging the clutch—there being cam-jaws between these two normally stationary parts—and one of the most ingenious features is, that the flange, $J K$, rides—with the ball-bearing between—on the stationary sleeve, instead of upon the driven shaft, F . Although, therefore, the "driving" discs are acted upon by a mechanism that rides on the "driven" shaft, yet there is no tendency whatever for the former to drive the latter except through the proper discs; if the flange, $J K$, were to

ride direct upon the shaft, F, this would not be the case. With these clutches, the same kind of lubricating oil as is employed for water-cooled petrol-engines is usually found to be most suitable, provided that the number of discs, and that the total area of the friction surfaces, are suitably proportioned to the work that has to be done. Apparently, the discs then run for a very long time without any appreciable wear, and it is impossible for them to grip one another too suddenly, however quickly the clutch-pedal may be released. One filling of oil lasts for a long time, if the joints in the outer-member are properly tight, for it does not seem to depreciate noticeably, in spite of constant use, on an ordinary car. An interesting point in connection with such clutches as these is that the actual clutch-effect is diminished—and not increased—as might at first be thought—by allowing the inner and outer discs to overlap one another further, for, although the area of the friction-surface is rendered greater, yet the pressure per square inch is at the same time reduced. As we said in our introductory remarks, a clutch of this kind materially alters the whole character of an ordinary petrol car, for it not only prevents sudden starting, through careless or unskilful handling, but

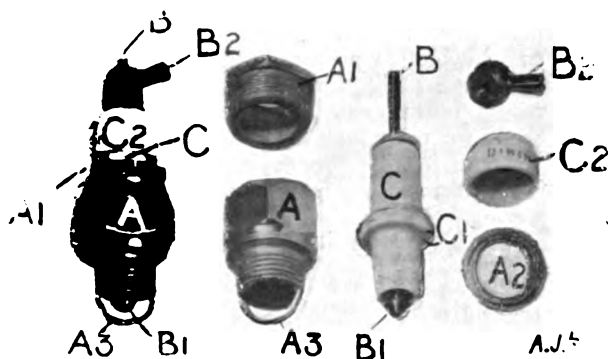
also enables the vehicle to be started from rest on a comparatively high gear, thus obviating constant changes of speed in traffic. Such a clutch is, of course, not intended to be used *continuously*, for varying the relative speeds of the “driving” and of the “driven” shafts, and it is therefore unnecessary to make any special provisions for keeping it cool.

Table of Reference Letters for the Bradley Clutch.

A	Crank shaft.	E	Clutch spring.
A ¹	Flywheel.	F ¹	Holes for clutch springs.
A ²	Detachable ring on flywheel.	G	Cardan shaft.
A ³	Oil retaining cover for flywheel.	G	Coupling on gear-shaft.
A ¹²	Friction discs carried by flywheel.	H	Sliding cam-boss for disengaging clutch.
A ¹³	Studs securing A ¹ , A ² , and A ³ together.	H ¹	Lever-arm for boss, H.
A ²⁰	Guide pins for flywheel discs.	H ²	Fixed cam-boss for disengaging clutch.
B	Boss forming driven member of clutch.	H ³	Lever-arm for boss, H ² .
C	D Flange forming part of boss, B.	H ⁴	Adjustable thrust-collar.
C ¹	Fixed thrust-ring for clutch discs.	H ⁵	Locking bolt for collar, H ⁴ .
C ¹²	Discs carried by inner clutch member.	J	K Flange forming sliding clutch member.
C ²⁰	Guide pins for inner clutch discs.	J ²	Moving thrust-ring for clutch discs.
D	Stationary stop-pins for separating clutch discs.	J ⁶	Pins, connecting J with J ² .
		K ²⁰	Sliding pins, for separating clutch discs.

THE “DININ” IGNITION PLUG.

An ignition plug which is of interesting construction has just been placed on the English market by Mons. A.



Godin, under the above name. In the accompanying illustration, the plug is shown complete, and alongside are

its principal component parts. One of its special features is that it may be easily taken to pieces, and, as all the parts are standardised, a broken piece may be renewed.

The body of the plug is formed by a metal fitting, A, and the central rod, B—which is embedded in the porcelain, C—is held in place by the screw gland, A¹, two copper-asbestos washers, A², serving to make a gas-tight joint around the collar, C¹, on the porcelain. The lower end of the central rod terminates in a semi-spherical knob, B¹, and the sparks take place between the knob and a bent wire, A³, which bridges the lower end of the metal fitting, A. The lower part of the porcelain, C, does not touch the rod, B, neither does it touch the fitting, A, so that the gases have free access to the pockets thus formed, and their scouring action helps to prevent short circuiting by any deposits. In order to increase the effective length of the upper part of the porcelain, a hollow dome, C², is fitted, as shown in the illustration, and is held in place by the neat terminal nut, B².

Forfar Speed Limit Enquiry.—A very exhaustive enquiry was held last week by the Commissioner for the Secretary for Scotland in regard to the application of the Forfarshire County Council to limit the speed of motor cars in certain roads and when passing public schools in the county. The hearing of the evidence occupied three days, the application being opposed strongly by the Scottish Automobile Club, who were represented by Mr. G. H. Robb, solicitor, Glasgow, instructed by Mr. Robert J. Smith, C.A., Glasgow, who also appeared for the A.C.G.B.I. and for the Motor Union.

“To prevent the reckless and inconsiderate driving of motor cars” is a resolution which was passed at a meeting of the Highways Protection League, just formed in Warwickshire, under the chairmanship of Lord Willoughby de Broke, Master of the Warwickshire Hounds. The fairness and real intentions of this association in championing their public rights may be judged by the fact that a proposition to include in the

resolution, “and other reckless users of the highway,” was very stoutly opposed and rejected. Lord Leigh is the President of this precious league.

RUMOUR in New York is persistently busy attributing to the Automobile Club of America the intention of promoting a motor Exhibition next year. In connection with the scheme, they will be probably associated with a new organisation which has just been founded in Detroit, entitled the American Motor Manufacturers' Association. This body has no doubt come into life through the action of those controlling the Selden “Master patent” although those responsible for the Association repudiate any such idea, their only purpose being, it is avowed, to arrange generally for the good of the industry, and hold suitable public exhibitions, &c. Its foundation will no doubt help, nevertheless, to stiffen the backs of several manufacturers who have been wavering in regard to their adhesion to the Selden “Master patent” controllers.

INDEX *Three*

INDUSTRIAL MOTOR VEHICLES.

At the present moment, the commercial motor vehicle is rapidly becoming a factor in daily life which no one can afford to neglect, for whether it be through the wholesale formation of motor 'bus services, or the increasing use of mechanical transport for goods by road, the British public is at least forced to observe that changes of a most important character are very surely taking place in the economy of to-day. Really keen, and at any rate intelligent, interest in any subject is hardly to be expected unless those concerned have acquired at least some detailed knowledge of it, and for this reason we hope that the special descriptions which we give this week, of some of the more important commercial vehicles, in their latest forms, and of some new types that have recently been introduced, will prove to be of general interest to motorists, besides being of particular use to those who are connected with the actual employment of such vehicles. Partly in consequence of the recent progress made with petrol engines, but chiefly in consequence of the Local Government Board's new regulations, a considerable number of new heavy steam vehicles have been designed during the last few months; several of these were shown at Olympia, and many others are to be on view this week at the Agricultural Hall Show.

The commercial side of self-propelled traffic is one which has for many years been developing under the skilled hands of engineers, and its advantages have, even in the past, been a boon to those who have had sufficient enterprise to adopt this form of traction. It is no new thing, as many people seem to suppose it to be, and it has certainly not sprung into existence spontaneously or suddenly. The progress of this branch of the industry, which has been sure, even if it has been somewhat slow, has been carefully—not to say minutely—chronicled by us in the past—as it will be in the future—and, even from the very first number, published in 1896, THE AUTOMOTOR JOURNAL has kept its readers informed as to the mechanical improvements and commercial successes which have taken place. In connection with the automobile exhibitions, we have always accorded to the heavy section that attention which its importance to the industry deserved, while such commercial vehicle contests as Les Poids Lourds of 1897, the Liverpool Heavy Vehicle Trials of 1898, 1899, and 1901, the Paris Cab Competition of 1898, and the War Office Trials of 1902 have received exhaustive treatment in our columns. Vehicles which to-day stand in the front rank, and are the result of many years' experience, can be seen in evolution amongst these records, and even those other systems which only came to go, nevertheless stayed long enough to be described, and to leave a record for others as to what *not* to do. From this comprehensive record of the past we have compiled a list of the most complete and most important articles to which we refer, and we reproduce it in tabular form below. It is, in itself, a commentary on the commercial vehicle industry, and it gives some indication of how the development of this important branch of engineering has been dealt with, step by step, in our pages.

THE IMPORTANCE OF PAST RECORDS.

Of the importance, at the present time, of such a record as that of which we can boast it is, we hope, unnecessary to speak, for we sincerely trust that users as well as manufacturers have profited by the lessons of the past and have now learnt that even a "boom" cannot ensure the commercial success of any mere combination of an engine, four wheels, and carriage body, and the most ingenious of "gears."

A brief glance through our list indicates very clearly that the internal combustion engine has, with but little more than one notable exception, been conspicuous by its absence, and that the industrial vehicles have until quite recently been developed with the use of steam as a motive power, a development which, by the way, has been almost entirely in the hands of the British engineer. For the very heaviest class of work, these steam vehicles have stood unrivalled, and, until the advent of the larger Milnes-Daimler petrol cars, they held a monopoly in the field of mechanical transport by road, although they have been unable to more than meet a fractional part of the existing demand for commercial cars. There can be no doubt now, however, that commercial vehicles using internal combustion engines, and those having such "one man control" steam systems as the Clarkson and the White, have an immense future before them, and that as yet several useful fields of work have hardly been touched by them. Their merits for omnibus work have already been proved, but the light delivery van, for instance, is a type which needs more attention from manufacturers, and is bound sooner or later to come into universal use by tradesmen throughout the entire country; few firms as yet have really seriously taken up its construction, and it has been the fate of those who are determined to possess such vehicles to content themselves with what is really only a touring chassis fitted with a commercial body.

ELEMENTS IN SUCCESSFUL DESIGN.

Finality in the design of petrol commercial vehicles has, in our opinion, not as yet been reached, for there are several features in the petrol touring car which, satisfactory as they are for that purpose, need modification before complete success can be ensured in industrial work. The demerits of the sliding spur-wheel type of change-speed-gear, for instance, may well be found to outweigh the undoubted merits that it possesses for pleasure vehicles, for it is questionable whether more than two forward speeds are necessary, at any rate for a light delivery van, and it is certain that a gear of this kind is only too likely to be the cause of anxiety to shareholders, when it is in the hands of more or less unskilled professional drivers, such as those that even the present demand for motor 'bus drivers will probably be instrumental in producing. It may, of course, be that for larger vehicles the advantages of a multiple-speed-gear of this kind will cause it to be retained, but if this be so, it will then be the clutch that will have to

undergo modification instead. Used in conjunction with a really suitable clutch—one incapable of taking up the load suddenly—this type of gear loses many of its drawbacks, and it will probably be retained by many makers on account of its cheapness and mechanical simplicity. On the other hand, however, some form of "fool-proof" gear will always be preferable, if commercially possible, and some firms have already introduced various forms of these, notably the Soames and the Brush, descriptions of which have already appeared in our columns.

So pronounced are the advantages, with heavy petrol vehicles, of being able to start gradually, and of avoiding sudden changes of gear-ratio while running, that the work already carried out by inventors of gradually-variable change-speed mechanisms is worthy of more than passing attention from those who are now making a study of the problem. Such devices as these are not only well calculated to render the gear "fool-proof," but they also allow the gear-ratio to be made to suit the load and the gradient to a nicety. With them, it is of course, largely a question of relative cost, reliability and absence of complication, as to whether they will come into general use or not, but it is at least important to realise that an enormous amount of pioneer work has already been done in this direction. The "Newman," the "Barber," and the "Hall" (hydraulic) gears are perhaps the best known examples, all of which have been most fully dealt with in our columns, as also has been the "Fisher" electric system—which is another almost analogous example.

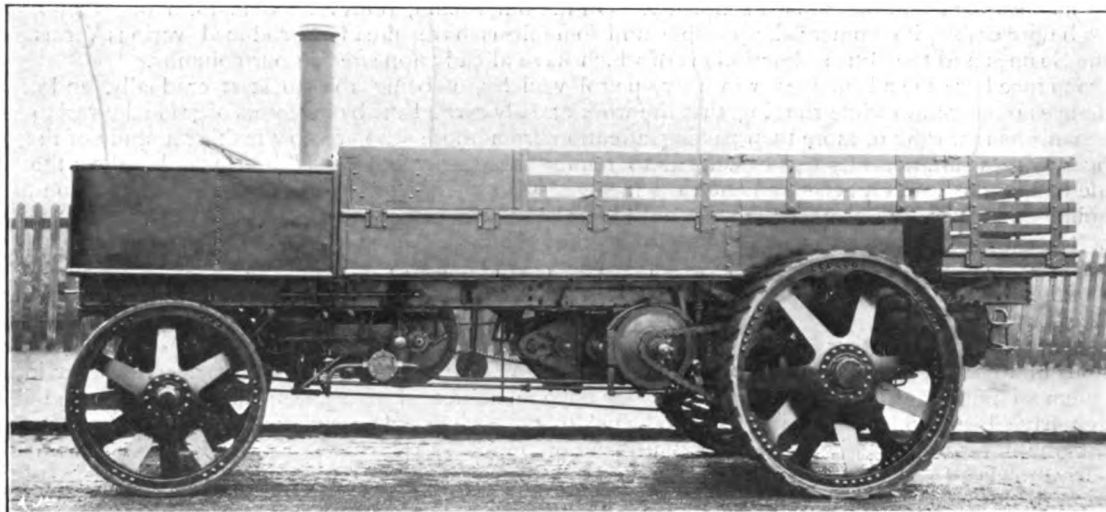
There are, too, many other directions in which, apart from that very important one—the tyre question—modifications of touring car practice have evidently been found to be beneficial. So numerous are they in fact, and many of them so important, that it would well repay anyone interested in the subject to turn up the illustrated articles that have been, and continue to be, published by us, even if only a cursory glance were bestowed on each system. It would, for instance, be recognised that many of the heavy vehicles now running are fitted with some sort of spring-drive device, to absorb most of the shocks which would otherwise be transmitted from the road-wheel to the engine through the entire driving mechanism. The steam luries made by the Thornycroft Company and by the Lancashire Steam Wagon Company have been so equipped for years, the chassis of the Milnes-Daimler petrol cars have wooden radius-rods that serve much the same purpose, the Wolseley and the Straker machines have springs arranged in conjunction with the radius-rods, and the Dennis Company have applied their spring-drive device to the heavy petrol vehicles they are now building.

Sufficient has been said to show that the commercial motor vehicle is well worth the very closest study of the user and the engineer, as well as of the manufacturer, for the success of such machines depends to a large extent upon a proper appreciation of the problems involved. The user is only too prone to think that, because one make of vehicle is giving satisfaction in some particular field of operation, that therefore any other car of an apparently similar sort is sure to prove successful under totally different conditions. The engineer, upon whose advice hundreds of cars might be bought for some important commercial service, would do the whole industry inestimable harm, and would ruin his own reputation, if he recommended an unsuitable type of vehicle. And, finally, neither user, engineer, nor manufacturer can have it too prominently kept before his notice that the success of a commercial vehicle of any kind depends, primarily, upon such constructional details as those we have above referred to, but, almost equally so, upon the adoption of a thoroughly sound system of supervision, of overhaul, and of general all-round attention.

SUMMARY OF THE PRINCIPAL COMMERCIAL VEHICLES AND SYSTEMS WHICH HAVE BEEN DESCRIBED IN "THE AUTOMOTOR JOURNAL."

Vol. I., 1896-7.		PAGE		PAGE		Vol. VIII., 1903.		PAGE	
Hornsby-Akroyd oil engine	15	Serpellet steam omnibus	395	Thornycroft steam system	483	Milnes-Daimler petrol van	245		
Thornycroft steam car	40	Fiat steam wagon	410	Mann steam wagons	485	Hindley steam lorry	399		
Lifu van	344	Thornycroft steam wagon	478	Musker steam system	520	Savage steam lorry	401		
		Clarkson burner	568			U.M.T. Co.'s petrol system	583		
Vol. II., 1897-8.		PAGE		PAGE		Mann steam lorry	774		
Thornycroft boiler	2	Vol. IV., 1899-1900.		Vol. VI., 1901-1902.		Savage steam lorry	929		
Thornycroft dust cart	24	Simpson and Bodman steam lorry	6	Yorkshire steam lorry	10	Thornycroft steam lorry	1108		
Scott's steam system	44, 437	Toward generator	36	Leyland steam lorry	52	Gillett steam van	1180		
Coulthard steam wagon	84	Blaxton generator	170	Thornycroft steam lorry	54				
Clayton and Shuttleworth's steam system	85	Thornycroft Co.'s works	196	Foden steam lorry	139				
Simpson and Bodman boiler	226	Mann steam wagon	283	Turgan and Foy boiler	168				
Merryweather steam fire engine	309	Steam generators	545	Jesse Ellis steam wagon	228				
Lifu lorry	326	Vol. V., 1900-1901.		Thornycroft steam 'bus	238				
Thornycroft steam tractor	377	Postel Vinay electric wagon	114	Vol. VII., 1902.					
Lancashire steam lorry	331	Musker steam wagon	161	Thornycroft steam wagon	97	Pedrail	113		
Toward steam tractor	482	Speedwell steam lorry	183	Napier petrol lorry	126	Cadogan petrol lorry	297		
Vol. III., 1898-9.		Carmont steam tractor	308	Fischer petrol electric 'bus	218	Lancashire steam wagon	407		
Lifu Works	7	Milwaukee steam lorry	311	German petrol luries	417	Hercules steam wagon	407		
Mann steam wagon	129	Cunningham steam wagon	312	Hagen petrol system	417	Robertson steam lorry	408		
Tangye generator	139	White steam wagon	312	Westbury petrol lorry	419	Brillie petrol lorry	409		
Coulthard steam vehicles	212	Herschmann steam wagon	313	Dr. Brightmore's steam lorry	453	Orion petrol lorry	409		
Toulmin and Coulthard generator	226	Ofeldt steam wagon	315	Pioneer Power Co.'s steam system	477	Stirling petrol vehicles	409		
Thornycroft steam lorry	282	Milnes oil motor lorry	421	Coulthard steam lorry	649	Londonderry steam wagons	470		
Rail ring tractor	290	Lancashire steam wagon	426	Lancashire steam lorry	679	Milnes-Daimler petrol system	1123, &c.		
Thornycroft steam wagon	330	Coulthard steam wagon	429	Pedrail	776	Glover petrol lorry	15, &c.		
		Simpson and Bibby steam lorry	432	Simpson and Bibby steam lorry	851	Vol. X., 1905.			
				Austman steam lorry	900	Straker-Squire petrol vehicles	39, &c.		

THE WOLSELEY INDUSTRIAL VEHICLES.



The 40-h.p. Wolseley Military Transport Wagon, which is fitted with a "heavy-oil" Engine.

It is probably not too much to say that no other firm in the world is devoting more attention to the construction of commercial vehicles, fitted with internal-combustion engines, than are the Wolseley Company, and that none will, for some time to come, be better equipped for attending to this important branch of the industry than they. For some time, a considerable amount of work has been done by them in this direction, and the enormous new shops that are now nearing completion at their Birmingham works are to be chiefly devoted to this branch of their business. The field that they intend to cover is a wide one, including, as it does, both road and rail vehicles for the conveyance of passengers and of goods, for they are laying themselves out—in addition to their extensive pleasure vehicle and marine work—to supply every kind of self-propelled industrial conveyance, from those capable of carrying only 5 cwt. up to luries for loads of many tons, and railway coaches requiring engines of one or two hundred horse-power.

Some idea of what the enormous programme before them means can be gathered from a study of what the company have already accomplished, though obviously it has hitherto been impossible for any firm to more than touch the fringe of the enormous demand for industrial vehicles that undoubtedly exists, and consequently the models already placed on the market can only be typical of numerous other forms that are to follow. We have recently been afforded every facility at the Birmingham Works for making a study of what has been done by them there, and are consequently able in this article to describe some of the interesting types that are now being turned out. Many of these have been in active service, either at home or abroad, for some little time, and it is particularly satisfactory to know that the field for all such vehicles has already been found by them to exceed even the most sanguine expectations of a year or two ago.

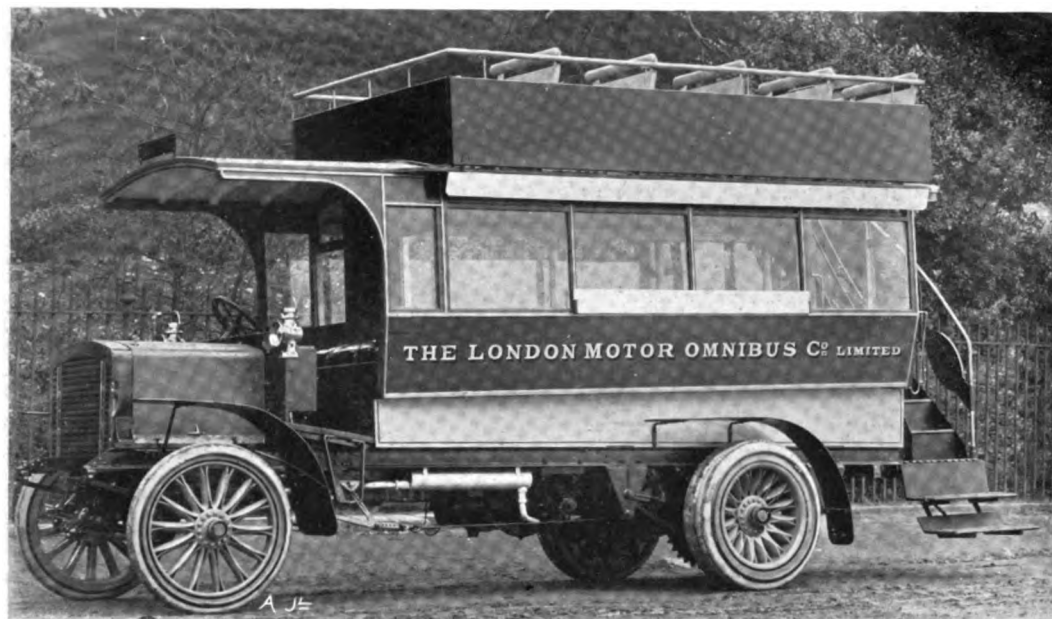
For use on the road, their largest vehicle is a 40-h.p. military transport lurry, which weighs about 6 tons in running order, and is capable of carrying 4 tons on its own platform, and of drawing a further 4 tons on a trailer. It—like the smaller models—has a horizontal engine, which lends itself so particularly well for purposes of this kind, since it occupies so little use-

ful space, being placed beneath the frame. The four cylinders lie alongside one another, projecting forward from the crank-chamber, and the engine is only intended to run at about 600 revs. per min.; the cylinders have a 6-in. bore and a 7-in. stroke. The two types of 'bus chassis, which are also employed for luries carrying two tons and upwards, are in general respects of similar design to the military wagon, though they are naturally considerably lighter. As 'buses, they have pressed steel frames—which are perhaps the largest frames of this kind that have as yet been made—and they lend themselves to the adoption of either single-deck or double-deck bodies. They are either fitted with a 20-h.p. slow-speed engine, having two cylinders, or with a 24-h.p. 4-cylinder engine, that has all four cylinders in line. On all these heavy cars, the same type of transmission gear that has proved so reliable on the Wolseley touring vehicles, has been adopted, though, in each case, certain modifications have been made to render it especially suitable. The clutch, for instance, is mounted on the first-motion-shaft of the gear-box, instead of on the crank-shaft, the second-motion-shaft is entirely distinct from the differential countershaft, and there are three independent sets of brakes—on the second-motion-shaft, on the countershaft, and on the road-wheels. A special feature of the 'bus chassis, too, is that short helical springs are introduced between the radius-rods and the back axle, so that they tend to absorb any sudden shocks between the road-wheels and the gear-box, in much the same way that the silent chain gives a considerable degree of flexibility between the engine and the gear-box.

For the lighter types of vehicles, such as delivery vans, &c., the standard single and double cylinder touring chassis have been found quite satisfactory, with but little alteration, for, as we have already pointed out, the driving mechanism interferes but little with the design of the body, since the space occupied by it is all below the level of the floor. For quite small vans, the very popular 6-h.p. chassis is admirably adapted, while the 12-h.p. type lends itself well for larger vans, self-propelled vacuum cleaners, or chemical fire engines.

(To be continued.)

THE THORNYCROFT LURRIES, OMNIBUSES, AND VANS.—PART I.



The New 24-h.p. Thornycroft Double-Deck Petrol Omnibus for 34 Passengers.

TAKING advantage of the wide experience that they have obtained in the past with their well-known steam wagons, and combining with this their more recently acquired knowledge of petrol engine manufacture, Messrs. J. I. Thornycroft and Co. are now supplying a very comprehensive range of commercial vehicles of all kinds, which are well calculated to meet all and every requirement in the way of self-propelled road traffic. Their works at Chiswick and Basingstoke, both of which we have visited lately, enable them to turn out a very large number of these cars, for although this is but one department amongst many, their premises are extensive, and all the numerous shops are extremely well equipped. Nowhere, perhaps, is the extraordinarily rapid development of the internal-combustion engine more forcibly brought home to one's mind, than at these Chiswick works; for, alongside the busy yard where so many torpedo boats have been, and are being, built, one finds as many men engaged on motor boat work, and, in practically the same shops where heavy steam vehicles have for some years been manufactured, numbers of petrol cars—both for pleasure and for commercial purposes—are now coming steadily through. Needless to say, the same careful attention to detail and general excellence of workmanship that have made such a name for the Thornycroft Company, are being bestowed on the latest products, and the fact that an engineering firm of this standing has entered so thoroughly into every branch of the industry is yet one more proof of the vital importance of the automobile movement.

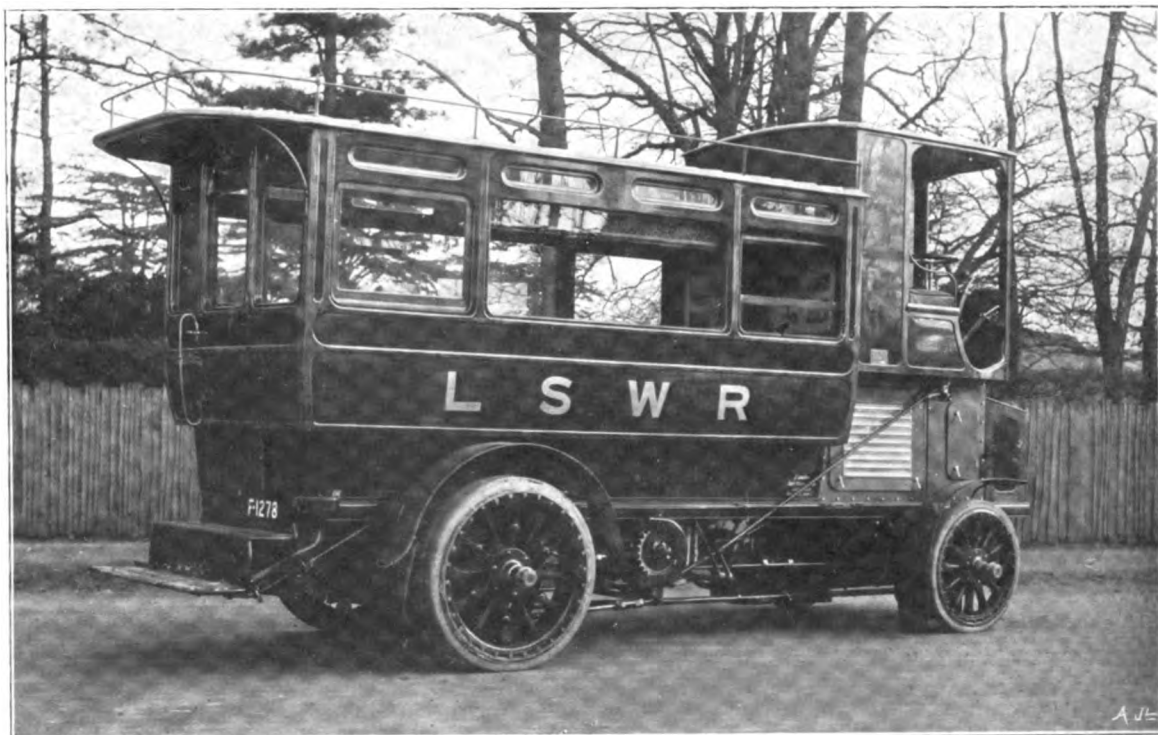
The Thornycroft commercial vehicles may roughly be divided into three distinct categories, and in each of these they now have one, if not more, new models, of which we are able to give full particulars. The new comer amongst their steam luries is a 5-ton vehicle, that differs in many ways, both from their well-known 4-ton wagon, and from the 5-ton Colonial vehicle that they have for some time constructed. It has been designed to comply with the L.G.B.

new regulations, and is capable of drawing a total load of about 8 tons up a gradient of 1 in 10. In the second category may be placed a very useful 5-ton tractor and a large 50-h.p. military lurry, both of which are fitted with internal-combustion engines; and in the other category are three petrol chassis, suitable for taking loads of from 10 cwt. to 2 tons, or for being fitted as 'buses. The 5-ton tractor and the military lurry have twin-cylinder and 4-cylinder engines, respectively, of the slow-running type, and either of them can be fitted with a special form of vaporiser, which enables ordinary lamp oil—instead of petrol—to be used as fuel; the cylinder dimensions, in both cases, are 6 ins. bore by 8 ins. stroke, and the normal speed is 600 revs. per min. The tractor, in outward appearance, resembles an ordinary steam traction-engine, for it has a funnel in front, and the engine is enclosed in a square casing immediately behind it. It can, moreover, be used as a "portable engine" for ordinary farm or other work, and the three speeds are available for running either backwards or forwards. A full description of its construction will be given presently, but it should be added, in this preliminary capitulation, that a winding-gear forms part of the equipment. The military lurry also has many special features that are interesting, and, although probably too heavy for use on ordinary English roads, would—apart from its military value—form a very useful machine in some of the Colonies.

The petrol vehicles are rendered especially suitable for ordinary industrial work, by having the same type of "spring-drive" device fitted to the driving-wheels that has always been employed on the Thornycroft steam wagons. Strong leaf-springs transmit the power from the axle to the felloes, and the wheels are mounted freely about the axle. Any sudden shocks are thus relieved from the transmission mechanism, and, when starting from rest, the load is taken comparatively gradually by the engine.

(To be continued.)

THE LATEST CLARKSON STEAM 'BUSES.



The New Double-Deck Steam Omnibus, built by Messrs. Clarkson at Chelmsford.

THERE is especial pleasure in describing any unique type of vehicle that has proved itself to be a success in practice, and particularly so if it is the outcome of the systematic and persevering work of an Englishman, as are the "Chelmsford" motor 'buses. In November, 1902, when we last gave a fully illustrated description of this make of machine, Mr. Clarkson had gone through many years of careful work in the development of his steam system, and was at that time building very well-made touring cars and private 'buses. Since then, although comparatively few radical modifications have been made on that particular type of chassis, he has continued to devote his attention to its still further improvement, and, as a result of the practical experience obtained from the numerous cars that have been supplied, has been able to bring it up to a very high state of perfection.

The Clarkson type of vehicle has proved itself to be particularly well suited for public service work both in towns and in country districts, so that it is but natural that an additional amount of interest should be taken in it now when there is so great a demand for motor 'buses.

Considering the popular prejudice that there is in favour of petrol cars, and against steam vehicles, it should perhaps be at once explained, for the benefit of those who are unacquainted with this system, that there are vast differences between a steam lorry and these cars, both as regards control and cleanliness. One man alone is needed, since the system is to a certain extent automatic, and, owing to the successful use of liquid fuel in the Clarkson patent burner, there is no smoke or odour, as there is from a coke fire. Another important point which should also be touched on in this introduction, is the question of fuel consumption, for it is pretty generally recognised that more fuel is needed to give the same

power with a steam than with a petrol engine, but the fact is apt to be overlooked that the oil used on the "Chelmsford" cars is very much cheaper than petrol, and that, therefore, the cost of running is no greater.

These vehicles are first-rate examples of sound British manufacture, and it is not too much to say that no finer workmanship is put into any other make of car to-day. They are built to last, and are constructed on thoroughly up-to-date principles, so as to give satisfaction in ordinary everyday use and at the same time to permit any part to be replaced from stock without any vexatious delay.

Some very important developments have recently been made, which, taken in conjunction with the detailed improvements with which we shall deal presently, ought to have a great influence in still further bringing the Clarkson vehicles into prominence. Hitherto there has been one mechanical drawback and also one commercial disadvantage that have had to be contended with. The fire-tube boilers have given a certain amount of trouble owing to leaking tubes, and it has, therefore, been of the greatest importance to overcome this difficulty. This has now been apparently accomplished by the adoption of a new process of construction, which bids fair to put an entirely different complexion on the fire-tube boiler question, for the tubes are now welded to the tube-plate instead of being merely expanded, and they, therefore, form a solid part with the shell. From the commercial standpoint, the earning capacity of a single-deck 'bus is small in comparison with that of a double-decker, and only this small type has hitherto been made; to meet the demand for a double-deck omnibus, an entirely new model is now, however, being put on the market.

(To be continued.)

THE 5-TON HERCULES STEAM LURRY.

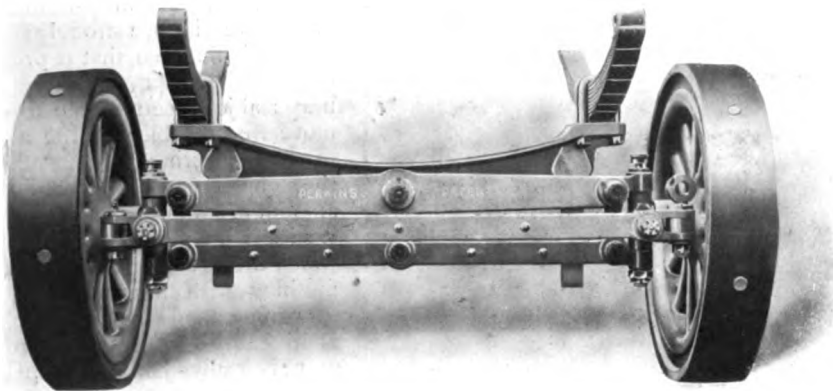
SEVERAL special and unusual features are possessed by the Hercules vehicle, some of which have already been referred to in our columns. The wagon itself is constructed with a channel frame, carried on four semi-elliptic springs, and its two rear wheels are driven by side chains. The boiler is fixed to the frame in front, but the cab for the driver is arranged between it and the dash, and there is a canopy arranged above the entire front portion of the lurry.

The front axle is one of the characteristic features of this machine, for it is arranged in such a way that all unevenness of the road is compensated for; either of the wheels can mount even a large obstacle without imposing any strains upon the framework, and without allowing

times kept true with the hubs, and the drive is taken direct to the felloes. Passing through the felloe and the tyre, are bolts which are tightened up by nuts inside the rim. Our illustrations show one of these driving wheels from each side, as also the inner steel casting of another wheel.

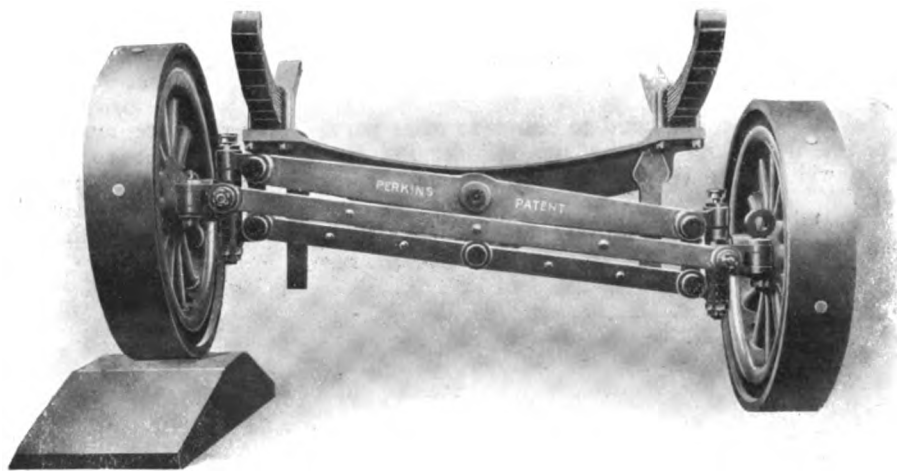
The boiler is specially designed to give a large heating surface, to be economical, and to have all the tubes beneath the water-level at all times. Its construction is well shown by the accompanying sectional drawing. The fire-box, A, is fed from above, through the large tube, A³, which passes down the centre of the boiler, and, except where the clinker-door, A², is fitted, the sides and crown of the fire-box are surrounded by water. The fire-bars, A¹, are supported, as seen, from beneath, and the

fire-tubes, B, pass up from the crown of the boiler into an upper compartment, C, that forms another portion of the combustion-chamber. Above the annular compartment, C, is the conical cover, C¹, that is formed by two plates with an air-space between them, and this cover forms a kind of hopper upon which the coke is thoroughly dried before being allowed to pass down into the firebox. The hot gases are led from the upper combustion chamber, C, into another annu-



either of the wheels to be tipped over from a vertical plane. For this purpose, the axle, with its steering-heads, is constructed, as seen in two of our illustrations, with a parallel-motion device connecting the two heads together; it is, further, pivoted centrally to a substantial cross-member, the ends of which are secured to the two side-springs. Projecting guides are also fixed to the cross-member for preventing the axle from moving bodily either forwards or backwards, and thus an extremely strong arrangement is obtained whereby the vehicle is virtually given a three-point suspension on its axles, although no transverse springs are required, and an Ackerman type of steering can be employed. The two illustrations that we give render clear the construction and operation of this ingenious arrangement.

The wheels employed are made mostly of steel, but, in order to render them resilient, they have wooden felloes introduced between the steel casting that forms the inner portion, and the steel tyre that surrounds the wood. The wood is held firmly in place between the flanges formed on the inner portion, these flanges, in conjunction with the tyre, effectively keying the felloe in position, and preventing it from splitting. The driving wheels have their large chain-wheels bolted to the tubular spokes close up to the rim, and thus the chain-wheels are at all



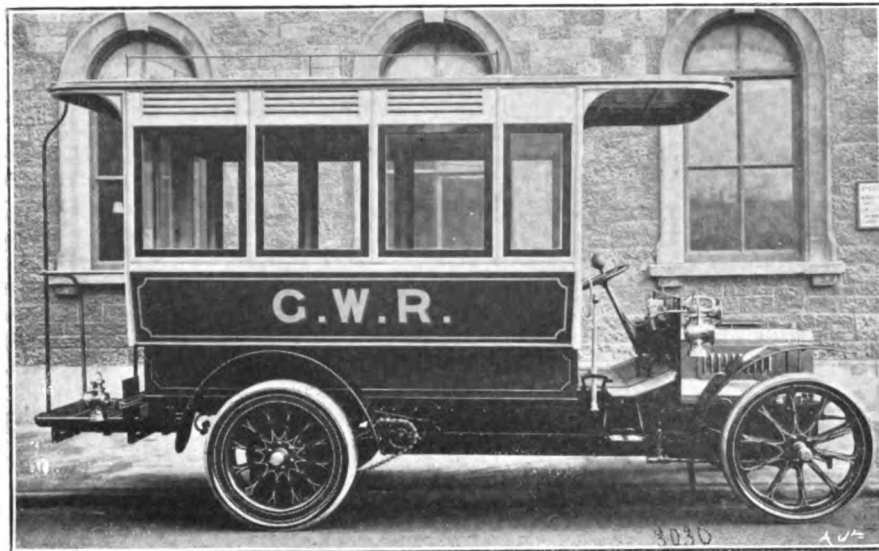
Two views of the Hercules Front Axle, showing the action obtained by its ingenious construction.

lar chamber, E—that surrounds the upper portion of the boiler—by a number of diagonal tubes, D, which—like the tubes, B—also pass through the water space. The gases finally find their way out to the chimney, F, after having given up their heat to that portion of the boiler which is enclosed by the compartment, E, and, since the water at all times covers the tubes, D—and reaches, in fact, a considerably higher level in the annular water space, G—there is no risk of any of the tubes becoming burnt, nor is it likely that any trouble should be experienced through unequal expansion of the boiler. The steam-drum is constituted by the upper part of the annular space, G, and the steam is led to the throttle-valve through a pipe-connection at H.

(To be continued.)

THE MAUDSLAY COMMERCIAL VEHICLES.

Two distinct types of chassis are now being manufactured by the Maudslay Motor Company for industrial vehicles of various kinds, the lighter design being similar in general respects to those constructed for the firm's touring vehicles, and the heavier model being intended to carry loads of about 5 tons. The single-deck 'bus, of which we give an illustration, is intended for public service work in general, and for the use of railway companies in particular. It accommodates from



The 14-h.p. Maudslay Petrol Motor Omnibus.

12 to 14 passengers, is geared to about 12 miles per hour, and is fitted with the new twin-cylinder 14-h.p. engine of which we gave particulars on February 11th last.

The chassis, which is of very much the same construction as that of which we gave an illustration on the same occasion, has the main-frame, as well as the under-frame for the engine and gear-box, constructed of tubing, having a square cross section, filled with ash. The wheel-base is about 9 ft. and the four wheels are fitted with 36-in. by 3½-in. solid rubber tyres, twin tyres being used on the drivers.

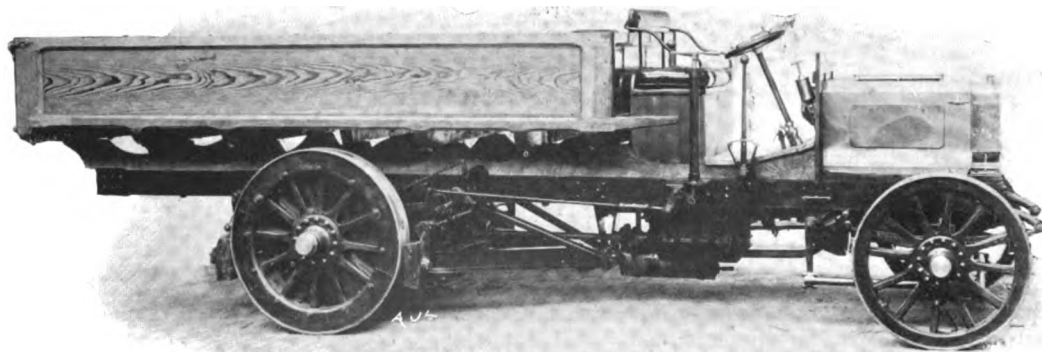
The foot-brake on the countershaft, and the hand-brake on the hubs, are all of the locomotive type and have easily renewable shoes.

The chassis is of sufficient strength to carry a 20-seated body if required, and is so designed that one of the 20-h.p. 3-cylinder Maudslay engines can then be substituted for the 2-cylinder model, to render it suitable for

this purpose. The delivery vans, that the Company are building, also employ the same chassis, these vans carrying loads of from 1 to 2½ tons.

Our other illustration shows the lorry which has been built for 5-ton loads, and it will be noticed that it is of altogether more substantial construction, with a different type of transmission mechanism. Fixed to the channel main-frame is an under-frame for the 27-h.p. three-cylinder engine, and for the gear-box, and, fixed rigidly to the back-axle, is another channel frame-work, that replaces the usual radius-rods, and is connected, centrally, at its forward end, by a ball-and-socket joint, to the main-frame. In order to receive it, a strongly stayed bracket is fixed so that it projects downward from the frame. The universal-joint permits the axle to move freely, subject to the action of the side springs; it thus relieves the chassis of a considerable amount of strain. The axle-framing carries a differential countershaft, which drives the wheels by pinions meshing with internally toothed gear-rings, and the countershaft is driven by bevel gearing, through a universally-jointed propeller-shaft, from the gear-box. In addition to the four semi-elliptic side springs, there is a transverse spring, at the rear, which carries the back ends of the pair of springs that are fixed to the axle.

Four forward speeds and a "reverse" are available, the top-gear being equivalent to about 10 miles per hour, and the gear-box is of that type in which the first-motion-shaft is mounted immediately above the second-motion-shaft. The bearings of the transmission-gear are fed with



View of the Maudslay 5-ton Petrol Lorry.

grease from a six-feed lubricator on the dashboard, and the first-motion-shaft is connected with the engine by a cone-clutch of much the usual type. The brake-pedal acts on brake-drums fitted on the countershaft, and the hand-brake is of the "screw-down" type, operating brake-blocks that press upon the steel tyres of the driving-wheels.

THE BRUSH PETROL 'BUS.

THE petrol 'buses, which are now being built by the Brush Electrical Engineering Company, made their first appearance at the recent Exhibition at Olympia, and naturally attracted a good deal of attention, owing largely to the great reputation which the firm have in the tramway and electrical worlds, but also to the fact that their new vehicles have several distinctive characteristics of their own. A special feature is being made of 'buses for use

in country districts, where it is not only necessary to run considerable distances and where the cost of operating a public service can to advantage be reduced considerably by dispensing with the services of a conductor. Four different types are, in all, being made, including double-deckers carrying 44 and 40 passengers, respectively, for town work and for country use, and corresponding single-deck vehicles. Our illustration shows one of the first double-deck country 'buses that was turned out, and

renders clear the manner in which the passengers are compelled, when entering and when leaving the vehicle, to pass the driver, whose duty it is to see that the fares are placed in a box fitted alongside him. This particular vehicle, however, is smaller than the double-deck types that have finally been adopted as a standard, and it will be noticed, too, that it has a live-rod form of transmission, whereas side-chains have now been substituted.

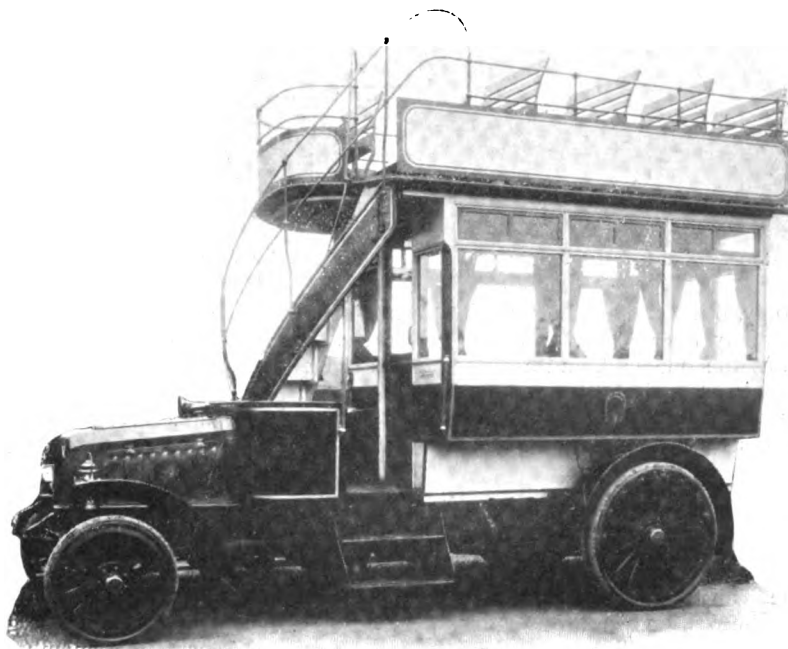
These 'buses, not unnaturally, have a very decided "tramcar" appearance, for although the engine is, as usual, placed beneath a bonnet in front, the driver's seat is arranged in a kind of "cab"—with the levers, pedals, and steering-wheel conveniently placed inside it—and access can only be gained to it from the "near" side.

The chassis for the double-deckers is extremely strong, with a channel-steel frame, carried on long semi-elliptic side-springs above the axles, and with an

outside chain to drive each of the rear wheels. The back axle is connected with the frame by the usual adjustable radius-rods, and all four wheels—which are built of wood with steel hubs—are 38 ins. in diameter. The front wheels have 3-in. solid rubber tyres, and there are a pair of 2½-in. tyres on each of the driving-wheels. The wheel-base is 11 ft., and the weight of the 40-seater, complete, is about 3 tons 5 cwt.

Carried on an underframe, is the engine and the change-speed mechanism, the former developing about 30-b.h.p. at 900 revs. per min., and the latter being of the special "King" type, in which separate friction clutches introduce each of the three forward speeds. The engine has four cylinders, with bore and stroke of 110 and 130 mm. respectively, and it is fitted with a high-tension system of ignition from accumulators. The gear, which was illustrated by us on February 25th last (p. 249), gives a direct-through drive

on the top speed, and permits all the gear-wheels that are required for obtaining the three forward speeds to remain in mesh at all times. The "low" speed spur-wheel, however, can be slid out of mesh with its fellow on the "through" shaft, in order to allow a "reverse" to be obtained, by bringing intermediate wheels into gear between them. The three forward speeds represent 4, 8, and 12 miles an hour, respectively, and the "reverse" is equivalent to 3 miles per hour. The gear is arranged in conjunction with a differential countershaft for the side chains, and the friction clutches that introduce each speed enable the load to be taken up gradually. A pair of foot-operated brakes are arranged on the countershaft—on either side of the differential gear—and the brakes on the hubs of the driving wheels are, as usual, controlled by hand.



View of a Double-Deck "Brush" Petrol Omnibus, constructed so as to dispense with a conductor.



THE CROSSLEY-LEYLAND PETROL OMNIBUS AND LURRIES.

AMONGST other well-known manufacturers of steam lurries who are now also building commercial vehicles fitted with petrol engines, is the Lancashire Steam Motor Company, of Leyland. They have not only already built a 2-ton lurry of this kind, but also, in conjunction

with the Crossley Company, a double-deck omnibus, which will, it is hoped, be on view at the Agricultural Hall Show this week. The standard lurries they are putting on the market are for 30-cwt., 4-ton, and 5-ton loads. The special features of the lurry—and the 'bus

chassis is practically identical, although it has a more powerful engine—are that a new type of change-speed-gear is employed, that the propeller-shaft which drives the live-rear-axle is enclosed in a tube that acts as radius-rod and torque-rod combined, and that an unusual type of brake is fitted to the hubs of the road-wheels.

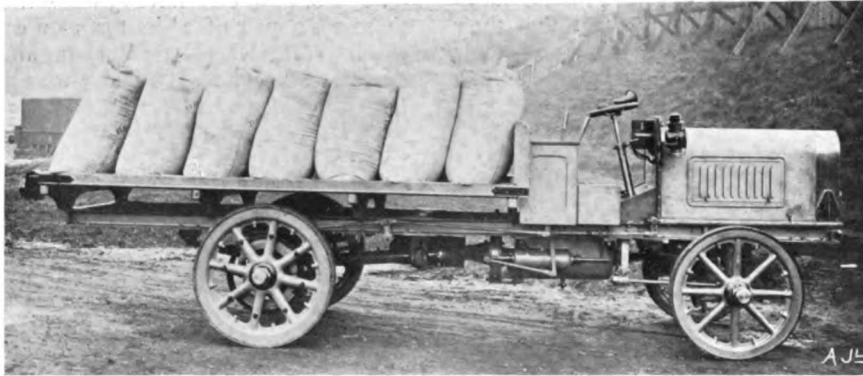
The main-frame, which is of channel steel, is carried on side springs in the ordinary way, and the engine is fixed in the same position, with regard to the gear-box, as on most live-axle pleasure vehicles. Except for the springs, the back-axle is only, otherwise, connected with the frame by the tube already referred to, this being rigid with the axle-casing, at the one end, and having a ball and socket joint between it and the frame, at the other end. The gear gives three forward speeds and a "reverse," but we have not as yet been able to obtain

particulars of its construction, although we learn that special provision has been made to render it "fool-proof," to the extent, at any rate, that no two speeds can be introduced simultaneously. The forward speeds represent 3, 6, and 10 miles per hour, and the "reverse"

is equivalent to the first speed.

The hub brakes are of the internal type, and are operated by a hand-lever. Each brake has two shoes mounted inside the drum, and these are pressed outwardly by a system of toggle-levers. The "torque" imposed on the axle by the brakes is

relieved from the springs by the same tube that takes the drive. The Crossley-Leyland omnibus accommodates 16 passengers inside and 18 outside. It is fitted with the 4-cylinder Crossley engine that develops 30-b.h.p. at 1,000 revs. per min., and has been designed to run at any speed from 200 revs. per min.



The 2-ton Leyland Petrol Lorry, built by the Lancashire Steam Motor Company.



THE SIMMS-COULTHARD PETROL LURRY.

THE petrol vehicle, the construction of which has recently been taken up by the well-known Preston firm, Messrs. T. Coulthard and Company, has been designed for carrying loads up to 4 tons, and is geared up to a speed of 8 miles an hour. It is, as will be seen from our illustration, of similar appearance, in general respects, to this firm's steam luries, with a cab in front for the driver, and with a very strong channel-steel main-frame, mounted on side springs, that are free to slide in guides beneath it. It has a platform area of 80 square feet, and is 17 ft. 3 ins. by 6 ft. 8 ins. over all.

The engine is of the 4-cylinder Simms type, with bore and stroke of 110 by 110 mm., and it develops about 30-b.h.p. Fitted in conjunction with it, and with the

main clutch, is a change-speed-gear of the Soames special type, of which we have already given full particulars, and in which, it will be remembered, jaw-clutches are employed for introducing either of the constantly-meshing trains of gear-wheels. Three forward speeds (2, 4, and 8 m.p.h.), and a "reverse" ($2\frac{1}{2}$ m.p.h.), are provided, and there is an automatic locking device that renders it impossible for the driver to change speed before disconnecting the main clutch.

The differential counter-shaft, which is bevel-driven in the usual way, has a solid shaft running right through from end to end, and the sprocket-wheel on the one end is connected with the differential by a sleeve that rides freely on the inner shaft. Means are also provided for



One of the new 4-ton Simms-Coulthard Petrol Luries.

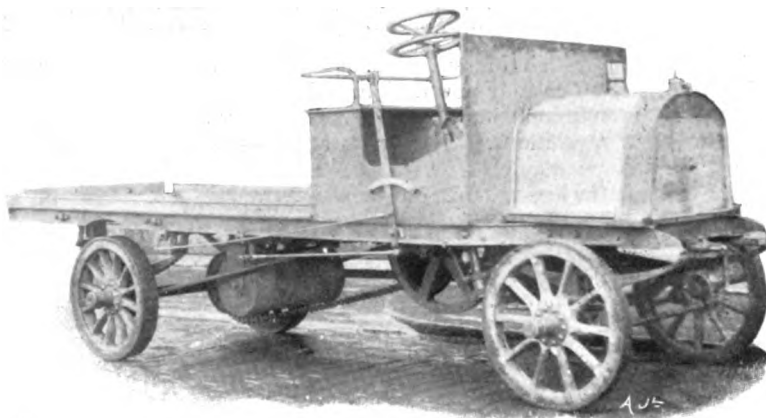
locking the differential—to enable the vehicle to extricate itself from abnormally muddy places—and the entire gear-box is secured to the side members of the frame by the same type of spherical-bearing that has been used, for some considerable time, on the Coulthard steam wagons. The driving wheels are connected with the countershaft by outside roller chains, and the chain

wheels are fixed to the road wheels in such a way that the drive is taken direct to the felloes, instead of to the spokes. The road wheels have oak spokes, ash felloes, steel hubs and steel tyres, the driving wheels being 3 ft. in diameter with an 8-in. face, and the front wheels being 2 ft. 9 ins. in diameter with a 6-in. face.



THE 2-TON "FRICK" PETROL LURRY.

THE Frick commercial vehicles, which include light delivery vans, and a variety of heavy vehicles ranging in power from 9-h.p. to 28-h.p., are characterised by the fact that a friction gear, allowing changes of speed to be made gradually from zero to the maximum, is adopted in them. Our illustration shows the 2-ton lurry, which is fitted with a twin-cylinder 14-h.p. engine that runs at a normal speed of 800 revs. per min. The cylinders have a bore of $5\frac{1}{4}$ inches, and the stroke is 6 inches. The power is transmitted through the friction-discs, and a single chain, to an axle of the "live" type, which is connected with the main frame, in much the usual way, by semi-elliptic springs, and by radius rods at each side. The wheels are all 32 inches in diameter, and the tyres are 5 inches and $3\frac{1}{2}$ inches wide on the rear and front wheels, respectively.



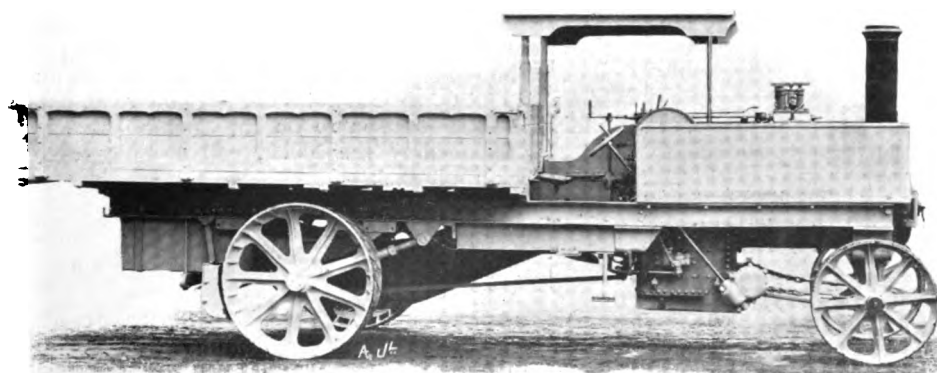
One of the "Frick" Petrol Luries, put on the Market by Messrs. Dougill, of Leeds. These vehicles have a gradually variable friction gear, operated by a wheel beneath the steering wheel.



THE 1905 STRAKER STEAM WAGON.

THE latest steam lurry introduced by the Straker Steam Vehicle Company differs in many important respects from their other, and already well-known, models. It has been specially designed for those users who are able to

paratively good roads. The new type is also specially suited to meet the latest requirements of the Local Government Board Regulations, for the tare weight is well under 5 tons, and yet the load-carrying capacity is considerable, though the weight limit per axle is not exceeded. Different as it is, however, from previous practice, yet most of the well-known Straker features have been retained, for, as will be seen from the accompanying illustration, the main-frame is supported by a central pivot above the front axle, the power is transmitted to the live-rear-axle by a single chain, and the differential gear is provided with a locking device for use when required.



The New Type of Straker Steam Lurry that has recently been introduced.

employ a more inexpensive type of vehicle, and who can dispense with the many refinements of these makers' 1904 wagons, if they only require to use it on com-

The new boiler is of the locomotive type, and the firm's standard compound engine is fixed horizontally above it, as on a traction engine, while a two-speed-gear

is introduced between the crank-shaft and countershaft, and the long chain transmits the power from this countershaft to the axle. The engine, the gear, and the axle are all practically identical with those employed on previous vehicles, being only modified to such an extent as has been found necessary in order to suit the altered relative positions of those parts.

The main frame is constructed of channel steel, and the front "dip-plate" has been retained, but it will be noticed that a chain is used for connecting the enclosed

steering-gear with the front turn-table, and it will be realised that certain small modifications have been necessitated owing to the employment of the horizontal type of boiler.

The wheels are steel castings. The bulk of the load is carried by those at the rear, and, as usual on vehicles of this kind, the water tank is fitted beneath the frame at the back. The water is normally fed to the boiler by a slow-speed pump, that is gear-driven from the crank-shaft, but an injector is also available as a stand by.

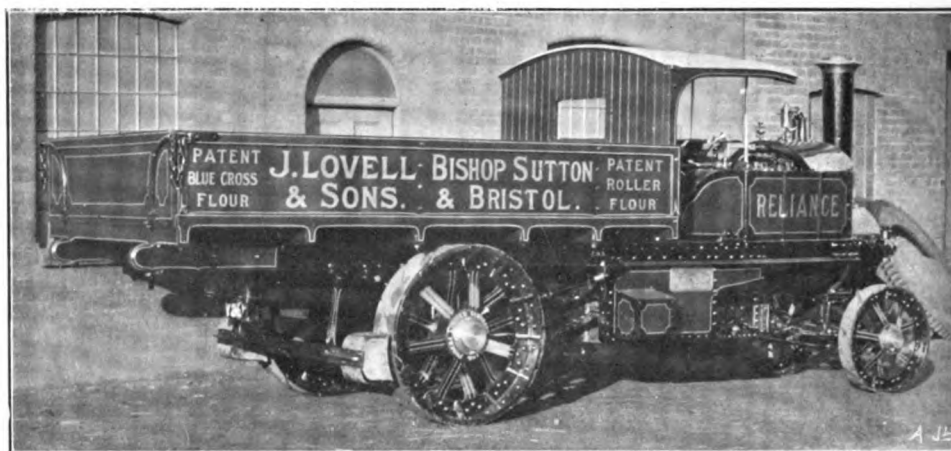


THE LATEST FODENS STEAM WAGON.

THE new lurry which Messrs. Fodens are now manufacturing, is of an entirely new design, and is constructed to meet the requirements of the Local Government Board's new regulations. It is constructed—as have been the previous models—on traction-engine lines, to a great extent; the live-rear-axle is driven by a single chain, and several other of the special Fodens features—which have proved so very successful in the past—have naturally been retained. It is intended to carry loads of about 5 tons on its own platform (which is 11 ft. long by 6 ft. 6 ins. wide), and to draw a further 2 tons on a trailer, on roads having a maximum gradient of up to about 1 in 7. The engine is of the horizontal compound type, and is fixed on top of the boiler, jackets being formed around them so that fuel is economised, by keeping them hot, and the jackets acting as a steam dome for the boiler. The high-pressure cylinder has a 4 in.

bore, the low-pressure cylinder a 6½ in. bore, and the stroke is 7 ins., while a special type of valve is fitted by which both cylinders can—when an extra effort is required—be fed with high-pressure steam, and both of them then exhaust independently into the funnel. The boiler is of the locomotive pattern, is constructed to work at 200 lbs. per sq. in. pressure, and it has a total heating surface of 90 sq. ft.

Arranged in conjunction with the engine is a two-speed gear, which enables the normal speed of the vehicle to be 3 or 6 miles per hour, according to which train of wheels is brought into operation. From the second-motion-shaft a large Renold roller chain passes to the differential-gear on the driving axle. The rear road wheels are 3 ft. 6 in. in diameter, by 10 in. across,



The 1905, 5-ton Fodens Steam Wagon, designed to comply with the new Regulations.

and the front wheels are 2 ft. 9 in. in diameter, with a 5 in. face. The front of the vehicle is supported by a transverse spring, and a steering turn-table; the back of the frame is carried on the usual type of spring each side. The water-tank holds 170 gallons, which represents about 15 to 20 miles on a good road, and, in addition to the force-pump on the engine, there is an injector for feeding the boiler, and a water lifter for filling the supply tank.



THE COULTHARD STEAM LURRY.

COMPARATIVELY little alteration has been made in the design of the latest steam vehicles turned out by this firm, for all the distinctive characteristics have been retained, and what improvements there are this year are of a minor character. One of the latest luries is shown in our illustration, this being built to carry loads of 6 tons, on its own platform, or to take 5 tons and to draw a further 3 on a trailer. Its overall dimensions are

19 ft. 4 ins. length, and 7 ft. width, with a platform area of 13 ft. by 7 ft.

One of the chief characteristics of these wagons is, it will be remembered, that the engine and the change gear are enclosed in an oil-tight case, which is rendered self-aligning in the channel-steel main-frame by a three-point system of suspension. Concentric with the countershaft are spherical bearings, between the casing and the

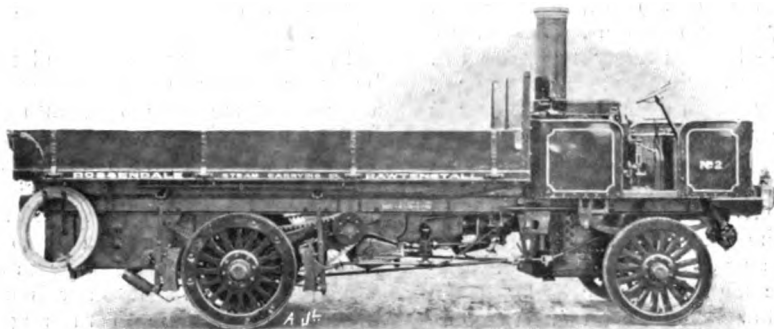
side members of the frame, while, in the neighbourhood of the cylinders, a double knuckle-joint is introduced, centrally, between the casing and a cross-member of the frame. The engine is of the two-cylinder compound type, giving about 30-b.h.p., and having a special valve for admitting high-pressure steam to the low-pressure cylinders. Connected direct to it, is a dust-proof feed-water pump, which takes its supply from the 160 gallon tank at the back, and delivers it to the boiler. The power is transmitted from the countershaft to the road wheels by Renold's chains of the "silent," type, these chains having been still further improved to such an extent, recently, that they are now even found to be satisfactory for such a purpose as this, *viz.*, for transmitting a high power at a low speed in an exposed position.

A vertical fire-tube boiler is employed, with a central tube, through which it is fired from above. The shell has two joints, made with bolts, to enable the upper

half to be removed for cleaning the tubes. It is constructed to work safely at a pressure of 200 lbs. per sq. in., and is tested hydraulically to 400 lbs. per sq. in. The fire-bars are arranged in such a way that they can be easily lowered at any time, and the boiler has all the usual fittings; the check-valves for the

pumps have shut-off cocks, to allow them to be examined when the boiler is under steam. As a stand-by for feeding the boiler, a steam-pump—which has independent suction and delivery-pipes from the tank and to the boiler—is provided, and the supply of water carried is sufficient for running a distance of about 12 to 15 miles.

The steering-gear on this lorry is arranged on the Ackermann system, and the worm and segment mechanism is enclosed in an oil-tight case. The wheels are of wood, with steel hubs and tyres, the driving-wheels being 3 ft. in diameter, with a 10 in. face, and the steering-wheels being 2 ft. 9 in. by 6 in.

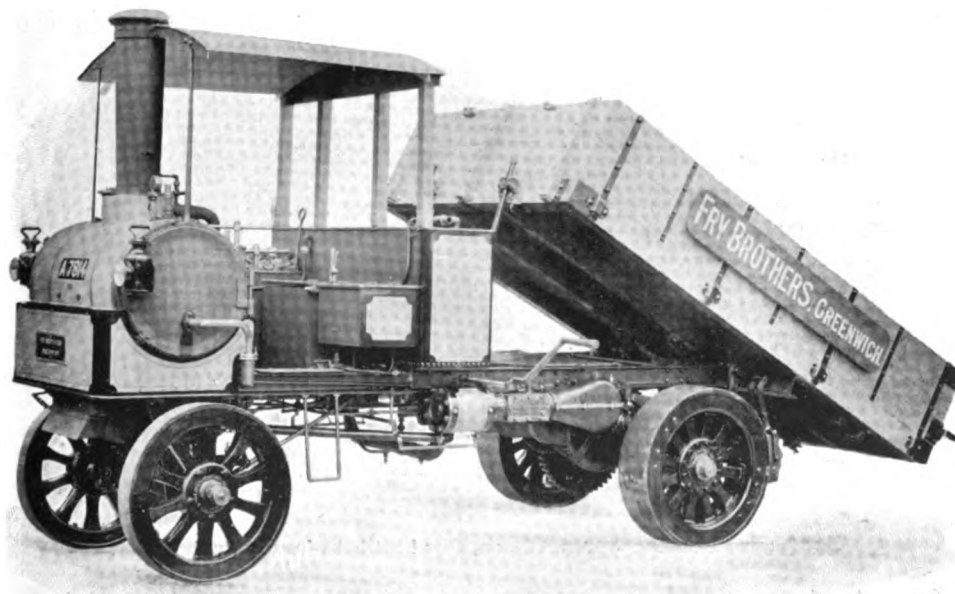


One of the latest 5-ton Coulthard Steam Luries.

THE 5-TON YORKSHIRE STEAM WAGON.

OUR illustration shows the steam vehicle which is to be shown by the Yorkshire Steam Wagon Company at the Agricultural Hall Show; it is, it will be noticed,

boiler being in some respects like those of the locomotive type, but—being placed transversely—it occupies very little room, and—having both the



The 5-ton Yorkshire Steam Lorry, 1905 type.

fitted with a tipping body having removable sides. The special feature of the luries made by this firm is the unusual type of boiler adopted by them, this

smoke-box and the fire-box arranged centrally—the water level is not affected to any great extent by varying road gradients.

The lurry is constructed with a channel frame that is mounted on side-springs above the rear-axle, and in a special manner, with horn plates and a transverse spring, above the front-axle. The steering-gear is arranged on the Ackerman system, and the vehicle has been constructed to comply with the new L.G.B. regulations. The available platform area is 11 ft. by 6 ft. 9 ins., and the total overall dimensions are 17 ft. by 6 ft. 9 ins. The wheels, which are—in this case—of the artillery type, are 3 ft. 3 ins. in diameter, by 10½ ins. wide, at the back, and 3 ft. in diameter, by 5 ins. wide, in front. The power is transmitted to the live-rear-axle by gearing from an intermediate countershaft, between which and the crank-shaft is introduced a two-speed gear of much the usual type. The engine has its horizontal compound cylinders fixed beneath the sides of the frame, and the valves are operated by a single eccentric gear, instead of by the ordinary link motion. The high-pressure cylinder has a bore of 4½ ins., and the low-pressure cylinder has a bore of 7½ ins., while the stroke of both is 7½ ins. The "low" speed is equivalent to 2½ miles per hour, at normal

engine speed, and the high speed represents 5½ m.p.h. under similar conditions. Between the second-motion-shaft, the back-axle, and the crank-shaft, are hinged steel brackets for allowing the axle to move relatively to the frame without interfering with the proper action of the cast steel gear-wheels. The back-axle is 4 ins. in diameter, the second-motion-shaft is 2¾ ins., and the crank-shaft is 2¾ ins.

In order to reduce noise, and to prevent sparks from being emitted out of the chimney, the exhaust steam is allowed to issue through jets into the return tubes in the boiler, instead of being led direct into the chimney, and another feature of the boiler is that the whole of the tubes lie below the water level in the boiler. The normal working pressure is, 75 lbs. per sq. in., and the boiler is fed with water by a pump that is driven by gearing from the crank-shaft, or by an injector which acts as a stand-by. Sufficient water is carried in the tank, at the back of the frame, for running a distance of 12 miles without refilling, and a water lifter with 30 ft. of hose is provided, as is usual on most wagons of this kind.



THE ROBERTSON HYDRAULIC TIP WAGON.

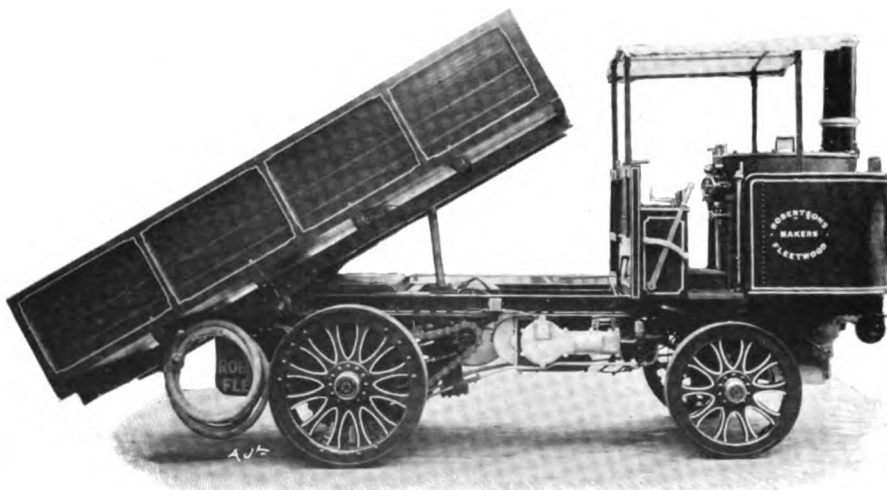
OUR illustration shows one of the 5-ton steam luries that is built by James Robertson and Son, and has fitted to it a special hydraulic mechanism for tipping the body without manual effort. The tipping gear consists of a hydraulic ram, into which the water can be forced from the usual 150-gallon supply tank (at the back of the frame), by the same pump that is ordinarily used for feeding the boiler. It is controlled by a valve that has been designed for this purpose, and the system is so arranged that no water is lost, but that it is all returned to the tank after use.

The lurry itself has an 8-ft. wheel-base, a track of 5 ft. 10¼ ins., an overall length of 17 ft. 6 ins., and a total width of 6 ft. 10 ins. It is of the chain-driven type, with outside chains for each of the rear wheels, and the channel frame has a three-point suspension. The back-axle is of girder section, and the side-springs, that are fixed to it, ride, at each end, in flat guides, beneath the frame. The front-axle is carried by horn-plates that project downward from the frame, and there is one large inverted cross-spring for supporting the frame above it. Special composite wheels, having their naves and tyres

formed by steel castings—and having hard wood spokes—are employed, and the steering-gear is of the Ackerman type. The rear-wheels are 3 ft. 3 ins. in diameter, with 10½-in. tyres, and the front-wheels are 2 ft. 9 ins. in diameter, with 5½-in. tyres.

The horizontal compound engine is fixed in much the usual position beneath the frame, and has its moving parts enclosed in an oil-tight casing. The high and low

pressure cylinders have bores of 4 and 7 ins. respectively, with a stroke of 5 ins., and, at a normal speed of 435 revs. per min., the power developed is about 25 - b. h. p. Combined with the engine, is an auxiliary valve for admitting live steam to the low-pressure cylinder, for giving an



The 5-ton Robertson Steam Wagon, fitted with hydraulic tipping gear.

extra starting torque when required; this—like the two-speed gear—is operated from the driver's seat. A pair of sliding pinions on the crank-shaft permit the gear-ratio between that shaft and the differential-countershaft to be changed, so that the relative speeds of the engine and the road-wheels are either 10 to 1 or 17.8 to 1. There is a clutch on the countershaft that enables the differential-gear to be locked solid if required.

The boiler is of the vertical fire tube type, but it differs from most other boilers of the kind, in that the tubes are arranged radially and horizontally, and that they pass from the inner shell (through which the fuel is fed down into the fire-box from above) across through the outer shell of the boiler. The outer casing is readily removable, without interfering with any of the boiler fittings, and, when taken off, it renders all the tubes very accessible for cleaning. The tubes are completely submerged beneath the water level, and a large steam space is available above them. The boiler has a heating-surface of 80 sq. ft., a grate area of 2 ft. 6 ins., is tested hydraulically to 400 lbs. per sq. in., and is constructed for a working pressure of 200 lbs. per

sq. in. Next week we hope to give a sectional drawing of it.

The fire-bars and the ash-pan are arranged in such a way that they can be lowered or raised by means of steel ropes and a gear mechanism; the worm-gearing can be locked when not actually in use. The arrangement adopted enables the flues and the fire-box to be cleaned without difficulty, besides obviating the need for any fire-door. Between the feed-pump—which is driven by enclosed gearing from the crank-shaft—and the boiler, is introduced a feed-water heater, through which is passed the whole of the exhaust steam from the engine; any steam that is condensed in it is returned again to the water-tank.



RACES, RECORDS, AND TRIALS.

Gordon-Bennett Cup Race.—In spite of the number of the French manufacturers still refusing to take part in the Eliminating Trials for representing France in this race, the entries are now beginning to grow under the new conditions, and already a dozen or more cars have formally been entered to contest for the honour of racing on behalf of France. These include a C.G.V. car, 3 Panhard-Levassors, 1 Gobron, 3 Richard-Brasiers, and 3 Bayard Clement cars.

Progress in regard to the British Selection Trials is being made in the Isle of Man. Last week in the Manx Legislative Council a bill authorising the running of these trials in the Island was read for the first time.

By way of a memento of the strenuous ordeal through which the drivers and their mechanics went, in connection with the Gordon-Bennett cars, on behalf of Great Britain, in the race, and who sought, in the Isle of Man Eliminating Trials last year, to represent Great Britain in the race, it has been decided by the A.C.G.B.I. to award gold medals to those who drove in the actual race on the Taunus course last year, silver medals to those who drove in the Isle of Man Trials, and bronze medals to the mechanics who rode on the cars in both of these events. In addition a special gold medal is to be presented by the Automobile Club to Mr. S. F. Edge for winning the Gordon-Bennett Race in 1902, and a silver medal to his cousin, Mr. Cecil Edge, who acted as his mechanic on that occasion.

Tourist Trophy.—£100 has been contributed by the Society of Motor Manufacturers and Traders towards the expenses of organising this trial for tourist vehicles. The latest entries, bringing the total up to 34, are two cars by Messrs. Charles Jarrott and Letts, Limited, and one Minerva car by Minerva Motors, Limited.

MR. S. F. EDGE, with justifiable *quasi* paternal pride, points out that, at the present time, the world's record for speed both on land and sea is held by this country. The 6-cylinder Napier car holds the world's record for speed on land at the rate of 104.65 m.p.h., and the Yarrow Napier 40 ft. boat holds the world's record for speed for a motor boat, viz., 29.925 m.p.h. No other country, we believe, has ever before held both these records at the same time, and the fact that Great Britain now does so is a most satisfactory proof that this country is not so greatly out-distanced by her foreign competitors as is frequently pretended in some quarters.

Vanderbilt Cup.—Last week we gave some alterations in the rules governing this Cup. We now learn that the entrance fee has also been altered. It will be £100, without any rebate to either starters or non-starters. Last year it was £60, one half of which was returned to the entrants who actually started. It has also been decided that Americans owning cars constructed abroad must enter their cars in the race through the clubs of the country where their vehicles were manufactured. Any club winning the Cup, it has been also determined, may take the Cup without depositing a cash bond. In all probability, the course will be the same as last year, viz., on Long Island.

Amateur versus Professional.—An endeavour is to be made by the American Automobile Association to draw a line between the amateur and the professional driver of motor cars. The task is no easy one, and as a basis the Racing Board of the Association inclines strongly to an entire separation of the two elements. In regard to manufacturers who themselves engage in racing, it is considered that sportsmanship is the main underlying principle of their taking part in competitions, and that accordingly they should be included in the amateur class.

Commercial Vehicle Trial.—The trial for public service vehicles and commercial vans, under the auspices of the A.C. de France, taking place in August, will be held in the north-west of France. All vehicles actuated by mechanical motors are qualified to enter, except electric vehicles. The trials will extend over 11 days, divided into seven long-distance runs, and four days will be devoted to exhibitions at leading cities en route. The distances for the two types will vary from 100 to 200 kilometres per day. There will be six categories for commercial vehicles, varying according to the load carried, from 50 kilogs. up to 2,000 kilogs. and over; for public service, vehicles with accommodation for from six passengers up to twenty-four passengers and over will be admitted. There will also be another category for vehicles hauling several trailers.

A SPECIAL effort is now being made by the A.C. de France to obtain entries for this competition, as it has been recently keenly realised that, in regard to commercial motor vehicles, France is hopelessly out of the running, and they, therefore, hope by this and other

competitions, which are now being organised, to in some measure make up for past shortcomings in this respect. A special "whip" has been sent round by the club, inviting both French and foreign manufacturers to enter for this contest. The chief towns which will be visited during the trials will be, starting from Paris, Compiègne, Amiens, Dieppe, Havre, Rouen, and Mantes. The one-day exhibitions will be held at Amiens, Dieppe, Havre, and Rouen.

Brighton Motor Meeting.—Headed by the Mayor of Brighton, the Corporation are in every way endeavouring to help forward the automobile meeting to be held at Brighton in July. The General Purposes Committee have appointed a sub-committee to carry out the arrangements, comprising the Mayor, Aldermen Buckwell, Marx, and Sendell, and Councillors Colbourne, Lintott, Titcomb, and Wilson, with power to co-opt members.

Efforts are being made to expend £3,500 in putting Madeira Road, where the races will be held, into perfect condition.

Heavy Oil Competition.—The competition, organised by *L'Auto*, for vehicles fitted with internal-combustion engines using heavy oil, took place from Paris to Rouen on Monday last. Only four entries were received, and of these but three started, namely, a 15-h.p. Charlton car, fitted with a Constantine carburettor; a 10-12-h.p. Brillie lorry, fitted with a Claudel carburettor; and a 16-h.p. Delahaye car, also fitted with a Claudel carburettor. Of these three competitors only the Delahaye and the Charlton arrived at Rouen, in the prescribed time, early in the afternoon, allowing for compulsory stops, and, as the Delahaye was the first in, the victory rests with a Claudel carburettor. The consumption of the winning car, which weighed 1,535 kilogs. ($1\frac{1}{2}$ tons), was 127 litres per tonne kilom. = 0.45 gallons per ton mile = 14.8 miles per gallon. The total distance was 127 kiloms., and the average speed of the winning car 30 kiloms. per hour—the maximum speed allowed.

Wheel and Anti-Skid Device Trials.—The long distance test for wheels and anti-skid devices organised by Mons. Saint-Chaffray in France on similar lines to those which held good last year commenced on Friday of last week at Paris. Eight entries were received, and four of these started to cover the prescribed route from Paris to Biarritz, Genoa and back to Paris, a distance of about 4,000 kilometres. The vehicles which started were as follows:—

1. 24-h.p. De Dietrich, driver Duray. Fitted with American Samson leather band. Weight, 1,970 kilogs.
2. 12-h.p. Corre, driver Buchillet. Vulcan tyres. Weight, 1,560 kilogs.
3. 16-h.p. Requia, driver Borquet. Fitted with Samson leather tread. Weight, 1,800 kilogs.
4. 16-24-h.p. Rochet Schneider, driver Gadan. Fitted with Cuir Samson de Paris. Weight, 1,440 kilogs.

Voiturette Trial.—The competition for voiturettes recently organised by *L'Auto*, under the auspices of the A.C. de France, will take place in July, entries closing on May 31st. Broadly the rules governing this competition are as follows:—Every French or foreign constructor may enter a maximum of three vehicles. Entered vehicles must have a minimum weight for the chassis and motor of 400 kilogs., and for the carriage work, 75 kilogs. The maximum cylinder capacity

allowed is 2 litres, and each vehicle must carry at least two passengers of not less than 70 kilogs. each. The award of the Challenge Cup will be determined by (1) a reliability endurance run, and (2) a speed contest. For the endurance run there will be six daily journeys of about 200 kiloms., which must be covered in a maximum of 10 hours. So long as cars cover this distance daily within the limited time they will all be co-equal in classing. Cars thus completing in the six days the 1,200 kiloms. will be qualified to take part in the speed contest, the result of which will determine the general classing. This speed contest will be over a distance of 250 to 300 kiloms., and for this portion of the competition constructors may change their carriage body. The entrance fee is 100 francs per vehicle.

Tyre Fitting Competitions.—The enterprise of the Continental Caoutchouc and Guttapercha Company has led them in the past to organise tyre-fitting competitions, of which the most recent took place, it will be remembered, at Olympia. The following list of best times shows what progress has been made, through repeated practice, on the Continent. The English competition, it will be noticed, gave a result which is about three years behind those obtained abroad—a state of affairs which our own chauffeurs will do well to remedy with but little delay. The following is a list of the best time for each competition:—

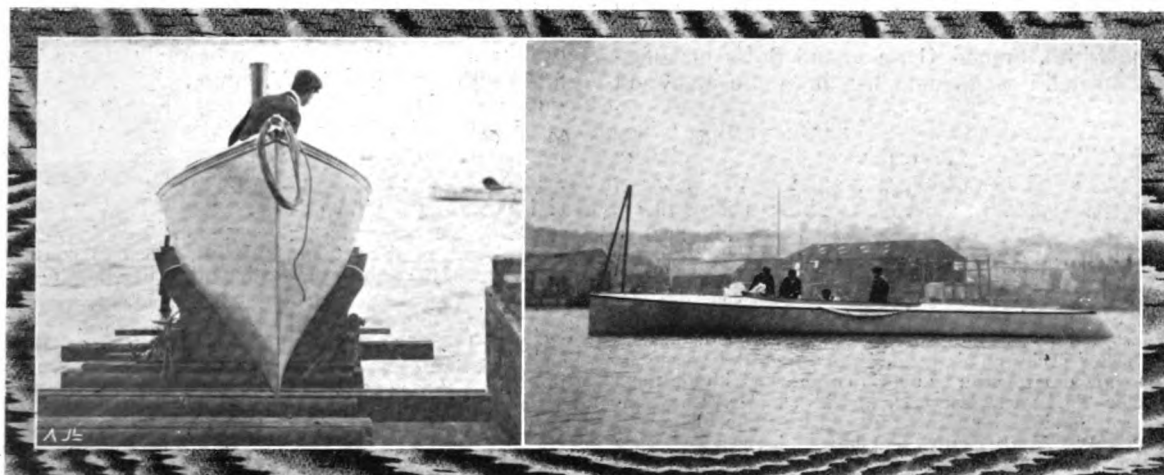
1902—Berlin ... 8 min. 18 sec.	1904—Frankfort 3 min. 23½ sec.
1902—Hamburg 5 min. 16½ sec.	1905—Berlin ... 2 min. 59½ sec.
1903—Berlin ... 4 min. 6½ sec.	1905—Olympia 5 min. 48½ sec.

A New Steam Racing Car.—M. Serpollet is bringing out a new steam car, which he hopes will prove a record breaker, and which will be capable, according to calculations which have been made (as usual by a complicated formula, in which V equals a terrifying vulgar fraction), of attaining the magnificent speed of 200 kiloms. per hour. We hope it may. At any rate, the particulars of the new car, which are at present available, are interesting. It is to have four cylinders of 150 mm. bore by 140 stroke—an enormous size, it must be admitted, for a steam car engine, and will, it is calculated, develop 200 h.p. at 800 revs. per min. If a sufficient head of steam can be kept, this is quite possible, particularly as the steam pressure is to be 30 atmospheres. The motor, it is said, will only weigh 150 kilogs. The boiler, it is not to be wondered at, will be of special construction, and designed for this special purpose, and the donkey feed already adopted in other of the latest Serpollet cars is to be employed. This new steam racer is to be particularly wide in track, and the body will be paraboloidal at both ends.

The awards for the best protecting device for the hands of drivers on a car against cold, instituted by Prince d'Arenberg, resulted in 133 devices being submitted to the A.C. de France. The 1st award has been made to Mons. Paul Meyan, the 2nd to M. Charles Crabbe, and the 3rd to MM. E. Devers and A. Nazy.

OSTEND Automobile Meeting has been fixed to commence on July 9th and finish on July 22nd, the intermediate days being occupied with a variety of events, including a tourist trial, speed contests for tourist cars over the flying kilometre, the mile, 10 kiloms., &c., in addition to which there will be motor boat races, brake contests, flower fêtes, &c.

MOTOR BOATING.



"THE NAPIER" RACING LAUNCH.—A view showing the fine lines of the bows is seen on the left, while, on the right, the illustration of the boat at rest shows the high freeboard.

"THE NAPIER" RACING LAUNCH.

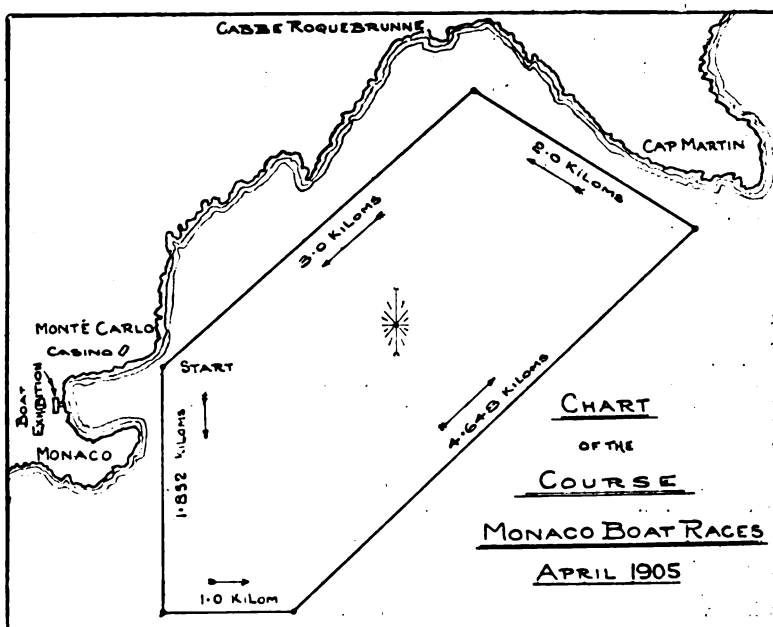
IN strong contrast to the reconstructed "Napier II" described by us last week, is Mr. Edge's new racing boat, "The Napier," of which we are now able to give two illustrations. The hull has been entirely designed by Mr. S. E. Saunders, and is as much a distinct departure in naval architecture as is "Napier II," although no two boats could differ more completely in their lines. It is constructed with four skins of mahogany on the Saunders principle, and has an overall length of 12 m. (39.4 ft.), while the beam is 4 ft. 6 ins.

Besides being extremely light—the weight complete with machinery being under 1 ton—the hull is at the same time sufficiently stiff for racing work, and appears to create remarkably little disturbance of the water at high speed. The boat is fitted with one 80-h.p. four-cylinder Napier engine, which lies partly below the water line, the hull being so constructed as to allow for a nearly horizontal propeller shaft. This forms one of the principal features in the construction of the boat, for by this arrangement the thrust of the propellers is always in line with the boat's motion. In order to enable this horizontal arrangement of the propeller-shaft to be adopted, the centre of the hull is formed into a kind of torpedo shaped trough for the engine, while the sides (which give the full beam) overhang this trough amidships, and thus provide two additional semi-bottoms to the boat which, being flat, give greatly increased stability, while adding but little to the cross-sectional area of the boat below water.

At the bows, the trough and the sides merge together and end in a very fine cut-water, which is clearly seen in the left-hand view of the above illustration. On the right, the boat is seen lying in the water, and it will be noticed that she is constructed with a considerable amount of freeboard. Not only will it be very interesting to watch the relative performances of this boat and

"Napier II" at Monaco, but, later in the season, an additional comparison will be available with the third Napier boat, which is being constructed for Mr. Lionel de Rothschild—particulars of which were given in our issue of December 10th, 1904.

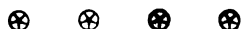
Monaco Motor Boat Meeting. April 2-16.—Many of the competing boats have already arrived at Monaco ready to take part in this, the second annual Monaco race meeting, which commences with the exhibition on April 2nd. The course has just been decided upon, and above we give a sketch map showing the points touched. The starting boat is opposite the Casino at Monte Carlo, and the first side of the course is a marine mile (1,852 metres) past Monaco—the other four sides of the course measuring respectively 1,000 metres, 4,648 metres, 2,000 metres and 3,000 metres. Total 12½ kiloms.



The five corners of the course are marked by buoys and two mark boats, so placed that the competing boats, which have to go outside them, must make a sweep of about 100 metres to pass round. The entries total to 106 racers, cruisers, and harbour boats. These include motors of British, French, German, and Swiss manufacture. A splendid programme has been prepared, and

the meeting gives every promise of being even more successful than last year.

Algiers-Toulon Race.—Madame Du Gast is amongst the latest entrants for this motor boat race. She will steer the "Camille," a 14-metre steel cruiser, constructed by Pitre. The "Camille" is entirely decked, and is fitted with a 90-h.p. C.G.V. motor.



CLUBS AND ASSOCIATIONS.

Beaumont Motor Club.—The opening run and meet of this club takes place to-day (Saturday) at the Castle Hotel, Woodford, Essex, to be followed by a well-arranged Bohemian concert. Mr. Fred Pluck, the proprietor of the hotel, is himself an enthusiastic automobilist, and has arranged ample accommodation for storage of cars and motor cycles at his hotel. The meet will be made the occasion to present a souvenir by the club connected with the 1,000 Miles Motor Trials held last year, in which motor scenes and incidents will be well illustrated. At Easter the club propose touring in the Wye Valley district, and during this run a Reliability Competition will be organised, in which penalisation for every stoppage or adjustment will be enforced.

Automobile Club of Great Britain and Ireland.—The annual general meeting of the Automobile Club was held on Wednesday, March 8th, at the Club House, 119, Piccadilly. The chair was taken by the chairman of the club, Col. H. C. L. Holden, R.A., F.R.S., and there were present, among others, Dr. Boverton Redwood, D.S.C., the Hon. Arthur Stanley, M.P. (vice-chairman of the club), Mr. Alfred Bird, Mr. S. F. Edge, Major F. L. Lloyd, R.E., the Hon. J. Scott Montagu, M.P., Mr. J. F. Ochs, Mr. R. E. Phillips, Earl Russell, and Mr. R. W. Wallace, K.C.

The annual report of the club for the year 1904, with the accounts and balance sheet and the budget for the ensuing year, were unanimously passed. The general council of the club was elected, and Messrs. Andrew W. Barr and Co. were re-elected auditors.

The chairman, in his opening remarks, said that the club was to be congratulated on the fact that H.R.H. the Prince of Wales had consented to become its vice-patron. He pointed out that out of a total income of about £16,500 the club had spent the not unsatisfactory sum of £10,000 on the encouragement side, as apart from the social side of the club. It was pleasant to be able to report that a much better understanding now existed between the club and the trade than perhaps existed formerly, one result of which was the highly successful Motor Exhibition at Olympia. The club had, during the past year, recognised the Society of Motor Manufacturers and Traders as representing the majority of the trade, and that recognition had been productive of harmony. He also drew attention to the institution by the club of the International Tourist Trophy Race, which could not fail to be productive of benefit to the industry generally, and which had already been taken up with enthusiasm by the trade. He also considered that the club was to be congratulated on the successful issue of the meeting of all the clubs on the subject of the holding of the Gordon-Bennett Race this year separately from the projected Grand Prix, and he was pleased to be able to say that, notwithstanding any differences there may have been at the commencement of the year, the club was now working in harmony with the foreign clubs.

The chairman also referred to the good work done by the technical side of the club, and to the Auto-Cycle Club, founded by the club for the benefit of the motor cycling side of the industry.

It has been decided to give gold medals to the drivers in the selection trials and the Gordon-Bennett Race of 1904, and bronze medals to the mechanics, and a special gold medal to Mr. S. F. Edge, the only British winner of the Gordon-Bennett Cup (1902), and a silver medal to his cousin, Mr. Cecil Edge, who acted as his mechanic on that occasion. The club committee, at their meeting on the previous Monday evening, had felt that some definite recognition was due on account of the services rendered by these gentlemen to the club.

The balance sheet showed a balance on the right side. Mr. Wallace, K.C., moved a hearty vote of thanks to the chairman, and congratulated him on the manner in which he had performed his arduous duties as chairman of the club, which was carried with acclamation.

The proceedings lasted an hour and a-half, and concluded with a vote of thanks to the officials of the club.

THE result of the voting for the gentlemen to constitute the committee of the club for the ensuing year is as follows:—

Mr. F. P. Armstrong.	Mr. J. R. Nisbet.
Mr. W. Worby Beaumont.	Mr. Wilson Noble.
Mr. Alfred F. Bird.	Mr. Henry Norman, M.P.
The Hon. Stuart Bouverie.	Mr. J. F. Ochs.
Professor C. Vernon Boys, F.R.S.	Mr. Mervyn O'Gorman.
Mr. Wm. J. Bull, M.P.	Mr. Robert E. Phillips.
Mr. Frank H. Butler.	Mr. E. Keynes Purchase.
Mr. Everard R. Calthop.	Dr. Boverton Redwood, D.Sc.
Mr. Theodore G. Chambers.	The Hon. C. S. Rolls.
Mr. E. H. Cozens-Hardy.	Mr. C. D. Rose, M.P.
Capt. H. H. P. Deasy.	Mr. Lionel de Rothschild.
Mr. S. F. Edge.	Earl Russell.
Mr. Henry Edmunds.	Mr. J. Lyons Sampson.
Mr. J. M. Gorham.	Mr. C. E. Shaw, M.P.
Col. H. C. L. Holden, R.A., F.R.S.	Mr. J. D. Siddeley.
Mr. J. A. Holder.	Mr. F. R. Simms.
Mr. C. Jarrott.	Capt. G. H. J. Skeffington-Smyth, D.S.O.
Mr. Claude Johnson.	Mr. Stanley Spooner.
Mr. G. C. Ashton Jonson.	The Hon. Arthur Stanley, M.P.
Mr. W. J. Leonard.	Mr. F. Strickland.
Capt. Sir Wroth Lethbridge, Bt.	Mr. Henry Sturmeay.
Major F. L. Lloyd, R.E.	Sir John I. Thornycroft, F.R.S.
Mr. E. Manville.	Mr. Robert Todd.
The Hon. J. Scott Montagu, M.P.	Mr. Claude Watney.
Mr. George Montagu, M.P.	Mr. Hugh Weguelin.

British Empire Motor Trades' Alliance.—A first general meeting of supporters of this new alliance was held last week at the Hotel Cecil, when the rules and constitution of the alliance were duly approved, as published by us a few weeks ago, subject to certain amendments. It was decided that companies and firms, not individuals, should become members, and the date for Founder Members to be eligible was extended to March 15th. Mr. Frederick R. Simms occupied the chair, and a good gathering of those interested in the industry was present at the proceedings.

Mr. Sidney Straker, president of the Society of Motor Manufacturers and Traders, in speaking upon the purposes of the meeting, pointed out that of 160 members of his society—which embraces practically the whole commerce in automobiles in Great Britain—about 25 were solely interested in British cars; and of the 160, 110 represented cars, the balance being interested in accessories. He deprecated the formation of the alliance, as he thought it would lead to friction with other branches of the trade.

Mr. Simms, Mr. Claude Johnson, and other supporters of the alliance, pointed out that there was no idea of creating friction between the existing bodies, but, on the contrary, that they desired to foster good relations with both the Automobile Club and the Society of Motor Manufacturers. It was considered that there was ample scope for the alliance in covering ground which at present was not touched by either of these bodies. The main business of the meeting was to elect a committee of management, and the following were selected by the meeting to act for one year: Messrs. Herbert Austin (Wolseley Motor Company, Limited), T. B. Browne (James and Browne, Limited), Thomas Clarkson (Clarkson, Limited, Chelmsford), S. F. Edge (S. F. Edge, Limited, Napier cars), E. M. C. Instone (Daimler Motor Company (1904), Limited), Charles Jarrott (Messrs. Jarrott and Letts, Limited, Crossley cars), E. Lisle (Star Engineering Company, Limited), Hon. C. S. Rolls (C. S. Rolls and Co., Rolls-Royce cars), Charles Sangster (Ariel Motor Company, Limited), Frederick R. Simms (Simms Manufacturing Company, Limited), John E. Thornycroft (John I. Thornycroft and Co., Limited), and two representatives of associate members.

East Surrey A.C.—At the annual general meeting of the club, held at the White Hart Hotel, Reigate, on Saturday last, Major Kingsley O. Foster, J.P., C.C., occupied the Chair. The report and summary of accounts were unanimously adopted, and some slight alterations in the rules approved. The election of officers resulted as follows:—President, Major Kingsley O. Foster; vice-presidents, Sir A. Rendel, Sir G. Livesey, C.E., Col. H. J. Robinson, Captain R. H. Rawson, Messrs. H. N. Corsellis, H. Bell, and J. Underhill; committee, Messrs. G. H. Bowden, N. Colman, F. W. Ellwood, W. F. Garside, H. Hughes, A. Gunning Keen, A. Macaire, J. B. Purchase, H. Rosling, J. Underhill, (Dr.) C. F. Wakefield, C. H. Whittington. Mr. D. J. Barry was unanimously re-elected hon. sec. and treasurer. The club has now a membership of 48, with the prospect of considerable increase during the coming season. Amongst the members elected during the year were three ladies, viz., Lady B. Rawson, Mrs. B. Amsden, and Miss M. Whittington.

Ladies' A.C.—Members of the club and their friends have arranged, in response to the invitation of Mr. Cordingley, to spend the afternoon of March 23rd in visiting the Automobile Exhibition at the Agricultural Hall, where afternoon tea from 3 to 6 will be provided for the members in a special room set aside for the club.

The French International Sports Exhibition, 1907.—Nothing has yet been decidedly official in regard to the locality where this important exhibition, which we some time ago announced, is to take place. Several sites have been suggested, and there is an indication that the final selection will rest between the Champ de Mars and Bagatelle, near the Suresnes Bridge. The various committees have been appointed for controlling the different sections of the exhibition, those representing the following being amongst these:—

Automobilism: Count de Vogue, Prince Pierre d'Arenberg, and M. Olivier Boccande.

Motor Boats: Count Récopé, MM. Tellier, Pitre, and Pabanel.

Aeronautics: Count Castillon de Saint Victor, MM. Robert Lebaudy and Archdeacon.

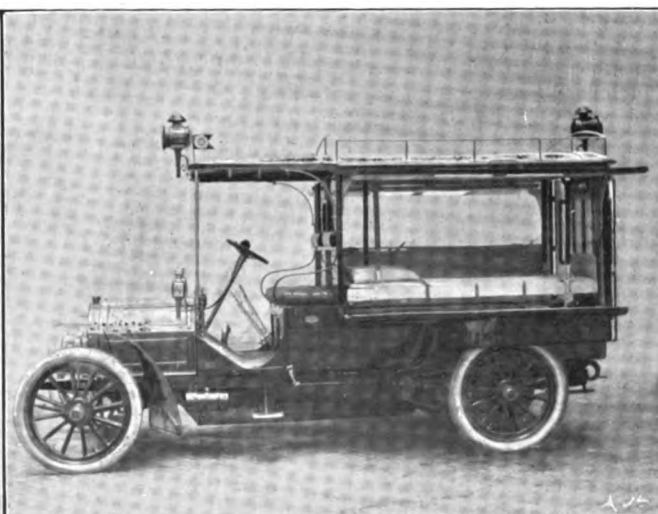
THE Stockholm Automobile Exhibition will be open from April 19th to the 30th next.

Nottinghamshire Automobile Club.—A very large gathering took place of the members of the club last Saturday at the Black Boy Hotel, Nottingham, when the chief attraction was an interesting lecture by the Hon. C. S. Rolls, on "The History and Development of the Motor." The chair was occupied by Mr. Charles Hardy, president of the club, who was supported by Mr. E. W. Wells, vice-president, and a large number of members. Before the close of the meeting Mr. Booth Grainger, the hon. secretary, gave an outline of the club's programme for the coming season which included the following: April 8th, Inter-club run to Ashby-de-la-Zouch; March 20th, meeting of general committee of the Motor Union at Nottingham, including several functions for the entertainment of the guests; June 17th, car trials and race for Wilson Challenge Cup; June 29th, Non-stop run for Foster Challenge Cup; July 8th, races on sands at Skegness, limited to touring cars; July 15th, hill climbing trials. In addition there will be week-end runs and an inter-club meet at Buxton with the Manchester and Sheffield Clubs, and another inter-club meet with the Lincolnshire and Peterborough Clubs.

Auto-Cycle Club.—At the special request of Mr. H. M. Wyatt, his Paper on "Magneto Ignition," which was to have been read on Tuesday last, the 14th inst., after the business of the Annual General Meeting of the club, was postponed until some future date.

ACCORDING to a War Office memorandum recently quoted by Lord Minto, the military authorities view with anxiety the coming of the motor omnibus, as it is likely to produce a reduction in the number of their best registered animals. Doubtless the framers of the memorandum are thinking of the South African War, when their losses of horses in the field were mainly recruited from the ranks of the London 'bus horse.

THE A.C. of America have at last selected a site for their new Club House in New York. It is to be in Fifty-fourth Street, just west of Broadway, in close proximity to the park, and best residential district up town, and is, moreover, in the heart of the new retail automobile section of New York. The building of the new Club House will proceed as rapidly as possible, and from the accounts given, promises to be a very magnificent structure.



In our photographs above are seen the new Ambulance car of the Vienna Freiwillige Rettungs Gesellschaft, the vehicle being seen from either side, the one view showing the interior exposed. This institution was founded in 1882, and has been in entire charge of the ambulance work in Vienna. The up-to-dateness of the Association has prompted them to embrace the first opportunity of bringing into use a motor ambulance of which the above is a picture. It was built in the Daimler Works at Wiener Neustadt. The generous and anonymous donor of this up-to-date vehicle is rumoured to be one who was not unintimately connected with the creation of the now famous name of Mercedes.



The Novel Poster issued by Messrs. Cordingley and Co. for their Exhibition.

Agricultural Hall Exhibition.—Messrs. Cordingley and Co.'s Annual Exhibition at the Agricultural Hall opens to the public to-day (Saturday) at 10 a.m., when, judging by the available list of exhibitors, an excellent display of cars should be on view, the industrial motor section of automobilism being particularly well represented. An attraction, no doubt, will be the identical Richard-Brasier racing car on which They won the Gordon-Bennett Race for France on the Taunus course last year. Music will be provided daily, and several important functions have been arranged during the period of the Exhibition, including the annual meeting of the Motor Union (Monday next), the annual meeting of the Motor Van and Wagon Users' Association on the following day, reception of Borough and County Surveyors and Engineers on Wednesday, and a meeting of the Automobile Mutual Protection Association on the closing Saturday. Wednesday will be a club day, when members of the A.C.G.B.I. and of the A.C. de France will be admitted to the Exhibition on presentation of their card of membership, whilst the Ladies' A.C. will hold a reception from 3 to 6 on Thursday.

LORD RAGLAN, Lieut.-Governor of the Isle of Man, has, in recognition of his

distinguished services to the automobile movement, been unanimously elected an honorary life member of the A.C.G.B.I.

No. 151 is the number of THE AUTOMOTOR JOURNAL stand at the Agricultural Hall Exhibition, taking place from to-day, March 18th to 25th. The position is the same as in previous years.

MR. F. W. BAILY announces that the Crystal Palace Automobile Show next year will be held from January 26th to February 3rd.

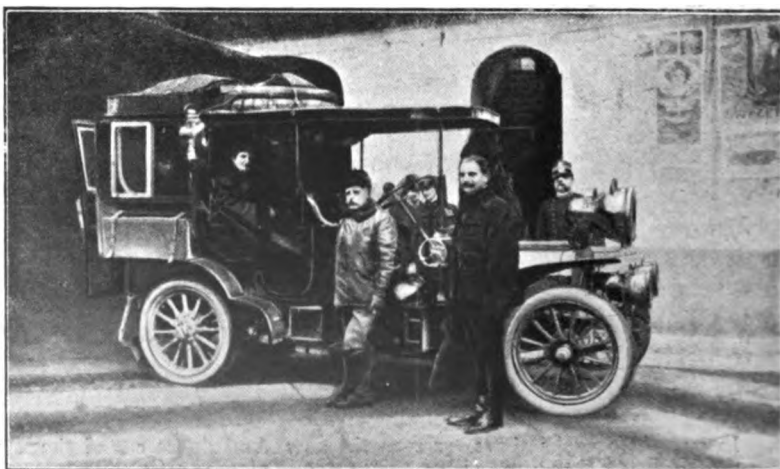
THE Star Omnibus Company, Limited, have decided to issue £75,000 of debentures for the purpose of placing motor omnibuses on their main routes.

THE London and North-Western Railway Company are within a few days inaugurating a service of motor 'buses between Mold and Flint for passengers and goods.

A MOTOR 'bus service between Dover and Lydd (Romney Marsh) *via* Folkestone, is proposed to be instituted shortly, linking up Dymchurch, Romney, &c.

THE RIGHT HON. ANDREW GRAHAM MURRAY, Lord Justice General and President of the Court of Session in Scotland, who has proved himself such a good friend and supporter of automobilism, has been created by the King a Baron of the United Kingdom with the style and title of Baron Dunedin of Stenton.

It is announced that at a Convention between representatives of the Automobile Mutual Protection Association, the Association Generale de l'Automobile de France, and the Chambre Syndicale de l'Automobile de France, it has been arranged for a joint International board to be appointed to deal with the various industrial matters concerning the industry. The representatives of the British Association were the Earl of Shrewsbury and Talbot, Sir David Salomons, Bart., Mr. E. Shrapnell Smith, and Mr. J. J. Mann.



We have recently chronicled an extended automobile tour carried out by Her Majesty the Queen Mother Margherita of Italy. Thanks to the courtesy of our contemporary, "L'Automobili," we are enabled to reproduce the above view showing Her Majesty en route in her Fiat Car.

MR. BASIL JOY, who, it will be remembered, recently tendered his resignation as head of the Technical Department of the Automobile Club, has now accepted the post of manager to the well-known firm of launch builders, Messrs. Simpson and Strickland, of Dartmouth. Messrs. Simpson and Strickland, who have had great experience in designing and building steam craft of all kinds, and particularly high-speed launches, are intending to take up the manufacture of petrol motor boats on a large scale, and there is even some probability, we understand, that a boat built by them may be entered for the International Cup Race this year. Mr. Joy's resignation of his post at the club does not take effect till next August. At that date, however, he will take up his new duties at Dartmouth. The knowledge and ability which Mr. Joy has brought to the discharge of his, often highly difficult, technical duties, while in the services of the Automobile Club, are an excellent guarantee of the wisdom of the choice which Messrs. Simpson and Strickland have made in selecting him for the important post to which they have appointed him. He will certainly carry with him into his new sphere of activity the best wishes of the large circle of friends which he has made during his connection with the Automobile Club.



COMMERCIAL POINTS.

Vacuum Mobiloids.—Each year brings forth a batch of diaries, pocket-books, and the like, compiled for the purpose of semi-permanent advertisement. Of such little books, that issued by the Vacuum Oil Company, and containing a list of their agents, &c., is most elegantly got up, being bound in red leather, with the recipient's name printed in gilt lettering on the cover.

Woven Glass Accumulators.—We have received the 1905 edition of Messrs. Van Raden and Company's interesting catalogue of electrical ignition appliances. The speciality of this well-known Coventry firm is their woven glass accumulator, which has achieved considerable popularity among motorists. The plates of this cell are formed by a grid, which is woven out of lead wire and glass wool, the active material being pasted on in the usual way. The elasticity of the spun glass enables the grid to expand and contract with the paste, while for additional security the whole plate is enveloped in a spun glass cover. The makers use spun glass also for their containing vessels, and they claim for their accumulators a very low internal resistance, and an absence of self-discharge.

Besides the manufacture of accumulators Messrs. Van Raden also make high-speed trembler induction coils, electric testing instruments, &c., while they also supply the "Manograph" high-speed indicator.

THE Shrewsbury and Challiner Tyre Company, Limited, are thoroughly to date in their methods of pushing their well-known motor tyres. In some illustrated matter recently issued by them, particularly drawing attention to their "Giant" tyre, they have embodied a coloured map showing the seat of the present war, and the relative proportion of the countries, giving at the same time a quantity of data in respect to both the Russian and the Japanese Empires which brings home to everyone the marvellous results which have been achieved by our allies when their numerical strength and the size of their country is taken into consideration.

FURTHER success has attended the "Chelmsford" steam omnibus, built by Messrs. Clarkson, Limited, in the South of England, the Torquay and District Motor Omnibus Company having, after an experience of about eighteen months with five of the "Chelmsford" vehicles, purchased a further three. This company, as we recently recorded, has paid a dividend of 7½ per cent. on their first year's working, and it is interesting to note that the first of the 'buses put on the road ran for nine weeks without a day's intermission pending the delivery of the second vehicle.

We learn with interest that the White Works at Cleveland are now assembling eight chassis a day, but so great is the demand for the 1905 type of White cars that even in spite of this large output the supply is only just keeping pace with the demand, and for

foreign countries only a certain proportion of cars can be allotted. The company have altogether supplied their customers with 500 of this year's 15-h.p. vehicles up to the 1st of the present month, and the whole of the cars in hand up to June next are already placed.

THE adoption of motor traction for industrial purposes throughout the country is daily becoming more noticeable, particularly in the southern counties. The revolution in handling goods renders well-equipped repair shops an absolute necessity if local needs are to be supplied at the minimum cost required to ensure profitable working. To meet this coming want, establishments are in several directions being installed, and one of the most recent is that of Messrs. Martin and Son, on the Bath Road at Newbury, where a well-equipped garage has just been established by them. The firm have been connected with the cycle trade for over twenty years, and have from the earliest days interested themselves in motors. Their works were originally in King's Road, but these have now been moved to the Bath Road at the foot of Speen Hill, opposite the well-known old posting-house, the Chequers Hotel. The garage will be open to receive cars day and night, and both waiting-rooms and excellent lavatory accommodation is provided. A long motor-pit, with sliding hatches in section, accommodating three or, at a pinch, four cars at one time, is provided, the whole being lighted by electricity from the roof, whilst, in a thoroughly up-to-date manner, wall-pushes are used for portable lamps for use under cars for night repairs. Lock-up bays for the storage of private cars are also provided, and the repair shops include a blacksmith's shop, a machine-room, fitted with lathes and drilling machinery of the latest type, the whole being driven by a powerful dynamo with current supplied from the town mains. As the foreman's house adjoins the premises, repairs can be undertaken day or night at a moment's notice. By the establishment of this type of garage and repair shops in country districts, the wonderful progress which is being made by automobilism is probably demonstrated more than by any other means, and is a healthy sign as to the future prosperity of the motor industry.

THE Sirdar Rubber Company, Limited, are desirous of contradicting the report that they now make a charge for removing the existing tyres, and fitting Royal Sirdar Buffer tyres. They advise us that they have never altered their system of removing the existing tyres free of charge, but, of course, where split spokes or splits in rims exist, they always advise customers, and ask for instructions in regard to replacing when the tyres are being changed.



An awful example of what our local authorities will do in the way of road repair when they get a chance is provided by the above illustration. It represents a Lancashire road in the Accrington district. The view in question shows a spot at which the former tramlines were taken up. Setts were then loosely laid down, stones spread over the top of them, surmounted by a top dressing of six inches of mud, and the whole rolled in. Needless to say the road has become awful during the winter after eight months' usage. The money for this "job" was provided by the Lancashire C.C., who apparently did not trouble to observe in what way the money they provided was employed.

NEW COMPANIES REGISTERED.

Jackson Resilient Hub Syndicate (Limited), 32, Victoria Street, S.W.—Capital, £21,000 in £1 shares. Object, to adopt an agreement with J. E. Hodgkin and E. C. P. Scott.

London and District Motor 'Bus Company (Limited), Basilston House, Moorgate Street, E.C.—Capital, £405,000 in 400,000 ordinary shares of £1 each, and 100,000 deferred shares of 1s. each. The ordinary shares are entitled to a preferential dividend of 10 per cent., and afterwards rank equally with deferred shares for surplus profits. Directors, A. A. Campbell Swinton, M.I.C.E., John Francis Albright, M.I.E.E., Esmond Caillard, Sir Anthony Compton-Thornhill.

London Power Omnibus Company (Limited), 5, Copthall Buildings, E.C.—Capital, £200,000 in £1 shares. First directors, G. C. Montagu, Captain the Hon. F. C. Stanley, T. F. Thomson, Captain H. H. P. Deasy, and V. D. Macdonald.

Mann, Egerton, and Co. (Limited), Bank Plain, Norwich.—Capital, £30,000 in £1 shares (15,000 cumulative preference). Object, to acquire (1) the business of electrical engineers and fitters, carried on by N. C. Mann and F. A. Jackson, at 5, Bank Plain, Norwich, and at Lowestoft, Ipswich, and elsewhere, as G. N. C. Mann and Co., and (2) the business of motor car engineers, carried on by the said G. N. C. Mann and H. W. Egerton, at 5, Prince of Wales Road, Norwich, and elsewhere, as Mann, Egerton, and Co. First directors, G. N. C. Mann, F. A. Jackson, and H. W. Egerton.

Motors (Birmingham) (Limited), 104, Digbeth, Birmingham.—Capital, £1,000 in £1 shares. Object, to acquire the business carried on by H. H. Smith (formerly by F. A. Powell), at Digbeth, Birmingham. First directors, T. I. Bonser and W. B. Line.

Motor Omnibus and Wagon Company (Limited), 79, Salisbury House, E.C.—Capital, £100,000 in £1 shares. Object, to acquire and carry out certain contracts relating to motor omnibuses and other motor vehicles, to adopt an agreement with J. G. Harvey. First directors, F. W. Thorp, H. C. Chambers, T. W. Appleton, W. T. Mallam, E. H. Saunders, A. E. Ledbury, and H. A. C. Webb.

Motor Trust and Agency Company (Limited), 3, Pope's Head Alley, Cornhill, E.C.—Capital, £1,000 in £1 shares. Object, to carry on the business of manufacturers of motor carriages, &c.

Nantwich and Crewe Motor 'Bus Company (Limited), Highfields, Wistaston, Nantwich.—Capital, £5,000 in £1 shares. First directors, S. Jackson, T. Smith, E. H. Manley, J. Crewe, H. Bower, W. E. Birchall, G. H. Proudlove, W. Young, W. Eardley, E. J. Dutton, J. Sadler, and G. Garnett.

Peebles Steam Car Company (Limited), 25, Victoria Street, Westminster.—Capital, £30,000 in £1 shares (15,000 preference). Object, to adopt an agreement with Bruce, Peebles, and Co. (Limited) and the Electric Conversion Syndicate (Limited), and to carry on the business of manufacturers of steam, electric, petrol, or other engines, &c.



BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, 232, Strand, W.C.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

28667. 7th December, 1904. Improvements in Braking and Clutching Devices. Paul Hallot, 79, Rue de Fontenay, Vincennes, France. The object of this invention is to govern the frictional action of a brake or clutch by means of the centrifugal force of masses enclosed therein. There are 25 figures. Fig. 1 is an axial section of a brake according to this invention, *a* is the friction plate or disc, *b* the outer cone of the clutch, *c* is a radial blade piece, carrying centrifugal weights. The disc, *a*, forms part of the sleeve, *e*, which is keyed on to the axle or upon a suitable shaft if used as a clutch. The part, *c*, having radial webs is screwed upon the sleeve, *e*, against a shoulder next the plate, *a*, and is fixed by a locking screw, *o*. Within the radial blades or webs in the piece, *c*, are carried weights, *g*, held in position by a flexible strip or spring, *h*, which surrounds them. The outer cone, *b*, is loose upon the sleeve, *e*, upon which it slides longitudinally under the action of the clutch fork, *i*, and of the ball-bearing collar, *j*. It is also provided with a groove upon

reduced the centrifugal action is less, and the friction will be less, and there will then be slip between the inner and outer cone and between the discs, *m* and *a*. Anti-friction blocks or strips, *p*, of graphite are fitted. In the outer cone, *b*, are channels, *r*, for lubrication purposes. To prevent an excessive amount of grease from reaching the friction surfaces plates, *s* and *t*, are fitted. The holes, *u*, are provided for escape of excess grease. The intention is by this construction to produce an automatically varying braking effect, so that the wheels shall never be absolutely stopped, thus reducing the tendency to skid. March 9th, 1905.

27764. 20th December, 1904. Improvements in and relating to Automobiles and the like. J. Spyker, Trompenburg, Iez-Amsterdam, Holland. The object of this invention is a construction of steering wheels in which the shock from meeting

Patent Specifications Published.

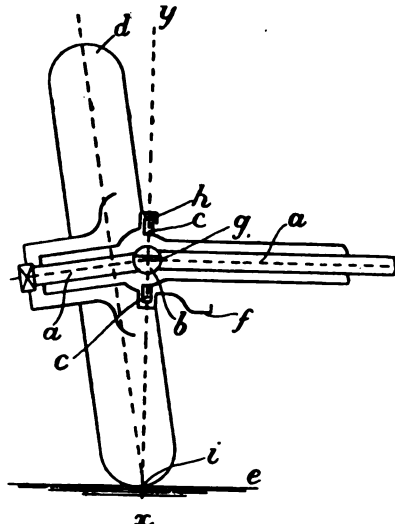
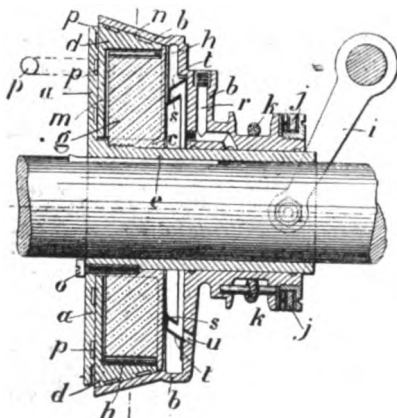
Applied for in 1904.

Published February 23rd, 1905.

- 23,907. MARQUIS A. DE DION and G. BOUNOT. Multiple cylinder engines.
- 25,754. A. TEMPERLI. Two-wheeled motor cars.
- 27,993. N. VARIOT. Exhaust boxes and vaporisers.
- 28,362. ALBION MOTOR CAR CO., LTD., and T. B. MURRAY. Carburettors.
- 29,059. L. RENAULT. Ignition plugs.
- 29,233. ALBION MOTOR CAR CO., LTD., and T. B. MURRAY. Ignition devices.
- Published March and, 1905.
- 2,708. F. KARMELI. Carburettors.
- 2,939. A. R. BULLOCK and F. ROEHL. Ignition appliance.
- 3,171. — SCOTT. Agricultural motor.
- 3,201. — BATE. Speed gear.
- 3,232. J. D. ROOTS. Internal combustion engines.
- 3,684. R. B. NORTH and S. SMITH. Speed indicators.
- 5,470. T. L. MITCHELMOORE and others. Controlling devices.
- 6,779. WOLSELEY TOOL and MOTOR CAR COMPANY and others. Controlling engines and mixture.
- 7,018. G. B. BORRILL. Carburettors.
- 7,101. J. W. FITCH and G. W. HOWARD. Engines.
- 7,992. H. H. DIXON. Wind screen.
- 9,426. G. W. CHURCH. Tail-lamps.
- 16,730. J. BARTLETT. Radiator.
- 17,893. L. RENAULT. Carburettors.
- 25,374. E. H. BELDEN. Variable speed gearing.
- 28,151. BROWN-WINSTANLEY MANUFACTURING COMPANY. Rotary explosive engines.
- 28,457. W. BACHMANN. Cooling interior of cylinders of four-stroke cycle engines.

Published March 9th, 1905.

999. F. H. SMITH. Controlling supply of vapour.
- 4,305. SAINSBURY'S ANTI-SKIDDERS. Skid preventers.
- 6,137. W. D. SAINSBURY and others. Skid preventers.
- 6,371. E. COOK. Wheels.
- 7,048. F. W. E. RYDE and others. Radiators.
- 8,558. J. COOKER. Water circulation.
- 8,917. A. C. DAVISON. Petrol gauge.
- 10,281. H. HOLZWARTH. Internal combustion engines.
- 17,909. C. WATKINS. Tyres.
- 18,773. F. KRAFT. Explosion motors.
- 19,504. SOC. CHARRON, GIRARDOT, and VOIGT. Friction clutches.
- 20,695. H. WEBER. Trolleys for turning automobiles.
- 20,899. C. H. BRYANT and A. WATLING. Carburettors.
- 23,211. M. W. DICKINS and others. Brakes.
- 25,199. F. WINDHAUSEN. Explosion turbines.
- 26,408. E. CANNEVEL and J. JOURNAUX. Motors.
- 27,066. A. G. R. CARLUND. Two-stroke engines.
- 27,764. J. SPYKER. Automobiles.
- 28,280. R. MEWES and SCHOMANN. Radiators.



which is wound a cable, *k*, for actuating the steering gear. The inner cone, *d*, is attached to the disc, *n*, which comes into frictional contact with the plate, *a*, while the cone surface, *n*, of *d*, engages with the cone surface of *b*. The interior face of *d* is cylindrical, and if the speed be sufficient to fling out the weights, *g*, by centrifugal action the spring plate, *h*, is brought into frictional contact with the inner surface of *d*. To apply the brake the driver has to operate the clutch fork, *i*, which presses the outer cone, *b*, upon the inner cone, *d*, which in its turn presses against the disc, *a*. If the speed be great the centrifugal action of the weights, *g*, by means of the plate, *h*, will make the parts, *a*, *c* and *d*, rotate as one piece, and as though the disc, *m*, of the cone, *d*, were secured to the disc, *a*. If the speed is

obstacles in the road is prevented by placing the centre of the turning pivot in the perpendicular line above the point of contact with the road. The drawing is a diagrammatic view of this construction. *d* is the tyre and *e* is the ground; *aa* is the axle of transmission of motive force and *b* is the universal joint in the axle; *cc* is the steering pivot of the wheel; *f* is the steering arm. The centre, *g*, of the universal joint is also the point of suspension or turning movement of the wheel, *h*, and this is on the vertical line, *cc*, passing through the point of contact, *i*, of the wheel, *d*, with the ground, *e*. March 9th, 1905.

The Automotor Journal, March 25th, 1905.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

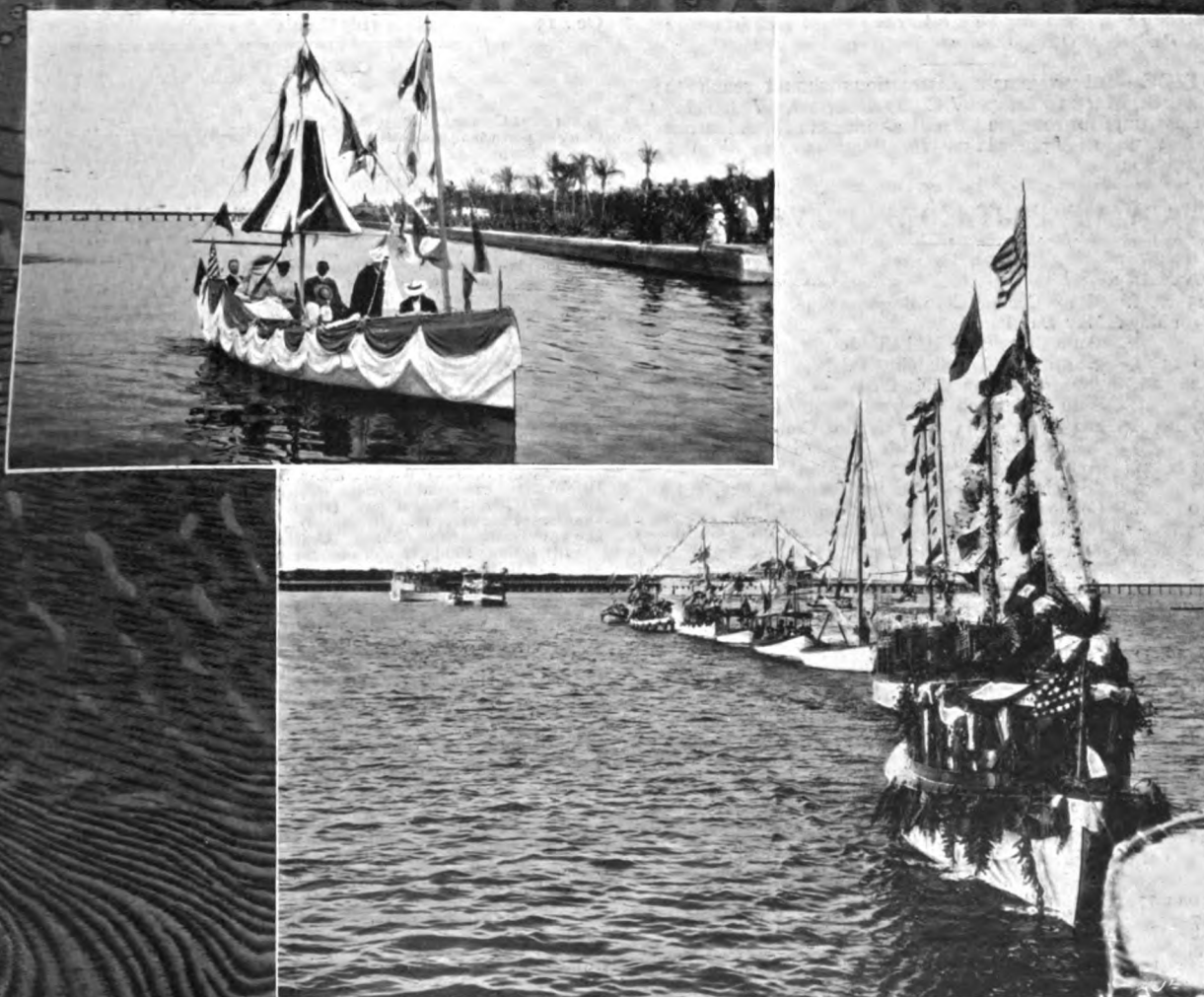
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MARCH 25TH, 1905.

[Registered at the G.P.O.
as a Newspaper.]

[Weekly, Price 3d
Post Free, 34d.]



Recently we gave some interesting photographs in connection with the Motor Boat Carnival which was held at Palm Beach. We have now received the above two characteristic photographs of the same meeting, which it has been determined to repeat annually, and already promises to be of increased interest next year

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THE AUTOMOTOR JOURNAL.

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VOL. I	PRICE	£5	5s.	VOL. V	PRICE	£1	1s.
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				VOL. IX	"	£2	12s. 6d.

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When any difficulty is experienced in procuring the Journal from local news-vendors, intending subscribers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.

NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C., by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
Mar. 25	Motor Cycling Club Brighton Run.
Apl. 29 or May 1	May Day Parade
May 6	Auto Cycle Club Hill Climb.
May 10-13	Scottish A.C. Reliability Trials.
May 12 or 19	*Quarterly 100 Miles Trials.
May 13	Auto Cycle Club Members' Penalty Run.
May 20	200 Miles Trial (Motor Cycling Club).
May 23	*Gordon-Bennett British Eliminating Trials.
May 24	Auto Cycle Trials and "Selection" Race.
June 10	*South Harting Hill-Climb (Members A.C.G.B.I.)
June 10	London-Edinburgh (Motor Cycling Club).
June 24	100 Miles Passenger Trial (Motor Cycling Club).
July 1	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 4-5	*Motor Boat Trials (Southampton).
July 8	Auto Cycle Club Consumption Trial.
July 13	*Hill-Climb (Henry Edmunds Trophy).
July 19-22	*Brighton Speed Races.
July 27-28-29	*Blackpool Motor Meeting.
July	24 Hours Run (Motor Cycling Club).
Aug. 11 or 18	*Quarterly 100 Miles Trials.
Aug. 14-19	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 19	*Van Trials, Light and Heavy Vehicles.
Aug. 26	Inter-Team Trial (Motor Cycling Club).
Sept. 9	Brown Cup (Motor Cycling Club).
Sept. 12	Auto Cycle Club Race Meeting.
Sept. 14	*Tourist Trophy (Isle of Man).
Sept. 15	*Daily Graphic Cup (Isle of Man).
Sept. 18-Oct. 3	*Reliability Trials.
Oct. 4	*Speed Trials.
Nov. 10 or 17	*Quarterly 100 Miles Trials.
Nov. 17-25	Society of Motor Manufacturers and Traders Exhibition at Olympia.

Foreign Events (Trials, Races, &c.).

1905.	
Mar. 15-Apl. 9	Copenhagen Exhibition.
Mar. 16-29	Vienna Exhibition.
Mar. 27-Apl. 5	Washington Exhibition.
Apl. 2-16	Monaco Motor Boat Fortnight.
Apl. 14-23	Nice Automobile Week.

* Automobile Club of Great Britain and Ireland Events and Papers

Apl. 17	Speed Mile and Kilometre (Nice).
Apl. 18	Coupe de Caters (Nice).
Apl. 20	Coupe Burton (Cannes).
Apl. 20-21	Cannes Motor Boat Meeting.
Apl. 23	Coupe Provinciale (Nice).
May	Paris Industrial Vehicles Trials (A.C. France).
May 4-12	Auto Cycle Club de France Tour.
May 11-25	Stockholm Automobile Exhibition.
June	French Selection Race for G.B.
June 18	International Motor Cycle Cup.
June 26	Mont Cenis Hill Climb.
July 7	Gordon-Bennett Race.
July 9-22	Ostende Automobile Meeting.
July 11	Start for Glidden Trophy (New York).
July 15	Calais-Ramsgate (Motor Boats).
July 30	Circuit des Ardennes.
Aug. 6-9	Paris-Trouville (Motor Boats).
Aug. 10	Gaston Menier Cup (Motor Boats).
Aug. 10-16	Herkomer and Bleichroder Races.
Aug. 11	Anthony Drexel Cup (Motor Boats).
Aug. 12	International Cup for Motor Boats.
Sept.	Brescia Automobile Meeting.
Sept.	Vincenzo-Florio Cup.
Sept. 1	Lake Geneva Motor Boat Meeting.
Sept.	Tourist Car Trial (A. C. de France).
Sept. 3-10	Royan Meeting.
Sept. 3-10	Spa Automobile Club.
Sept. 11	British International Cup (Motor Boats Arcachon).
Sept. 12-14	Lake Lucerne Motor Boat Meeting.
Oct. 1	Chateau Thierry Hill Climb.
Oct. 15	Gaillon Hill Climb.

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PASSING EVENTS.

The Chairman of the Club.

BOTH the Automobile Club, and the industry in which it is such an important factor, are to be congratulated on the action taken by the new committee at its first meeting, as reported briefly by us last week, in electing the Honourable Arthur Stanley, M.P., to be chairman to replace Colonel H. L. Holden, who, to the great regret of the committee, and in spite of repeated solicitations, had determined not to offer himself for re-election. Mr. Stanley was unanimously selected by the committee, and their choice is in every way an unexceptionable one. For several years past, Mr. Stanley has been an enthusiastic worker in the cause of automobilism, and his influence in the House of Commons, when the last Motor Car Act was being discussed, was of considerable value in assisting and directing the labours of those members who were specially in charge of automobile interests in the House. When, in the future, the Automobile Club and the automobilist members of the House of Commons are called upon once more to deliberate on a fresh Motor Car Bill, and to do what they can to secure that its provisions shall be less onerous to individual motorists, to the industry, and to the pastime, than those of the measure which will cease to be law in 1906, the standing of the club and the influence which its representatives and members in the House of Commons command, cannot fail to have the greatest influence in procuring the passage of a satisfactory measure. Mr. Stanley, with his seven years' experience of Parliamentary life, his close association with the leading members of the Conservative party, and his long and brilliant record both in the diplomatic service, in which he served with distinction for a number of years, and as private secretary to Mr. Balfour, will be the official representative and the actual head of the Automobile Club, and as such will be able to intervene in the debates with authority on behalf of the automobile movement. It is the first time that the actual official head of the Automobile Club has had a seat in the House of Commons, and we trust this circumstance will leave its mark on the next Bill that may be passed into law.

The Tourist Trophy—Legislation.

THE Tourist Trophy organised by the Automobile Club, to which we have frequently drawn attention, is now exciting a great degree of general interest and enthusiasm in automobile circles. It is satisfactory to know that the necessary legislative formalities are practically complete, and that little more remains to be carried out beyond the bare formalities of the picturesque ceremony such as was witnessed last year. On the whole, the Isle of Man course (which was used for the Eliminating Trials), though somewhat hilly and exacting, is an excellent one for testing tourist cars. The scenery is delightful, the air bracing, and the inhabitants, delighted with the visit of automobilists, which promises to bring prosperity, are courteous and considerate accordingly. So far, about forty cars are entered for the competition, and at least twenty more entries are expected. It is to be hoped that when the race comes to be run, practically every manufacturer in the Kingdom who builds a suitable type of car will be represented, and we hope that there will be a good showing of foreign competitors as well, so that the

relative merits of the English touring and the foreign touring car can be really compared, while if we win, as trust we shall, we shall not be winning a purely domestic contest.

♦ ♦ ♦

Asinus Communis as Speedometer.

SOMETHING unpleasant always rises to the surface to spoil the happiest reunions, but in compensation some of the most painful occurrences are frequently relieved by a touch of comedy. Such was the case, at any rate, in regard to the inquest held in connection with the unfortunate motor car accident which occurred at Welwyn, in Hertfordshire. There was the usual conflict of evidence regarding the speed of the motor car which was concerned in the accident, and while a publican, who boasted the bovine patronymic of Bullock, maintained that the speed was well over 20 miles an hour, the police for once entered the witness box on behalf of the automobilist, and established the fact that the speed was evidently not excessive, as from the time the car swerved, presumably when the brakes were clapped on, till it stopped, only 14½ yards were traversed. The really entertaining evidence, however, was provided by the owner of an *onomobile*, who stoutly maintained that he was an expert as regards the speed of motor cars, *as he had for some years been in the habit of driving a donkey!*

♦ ♦ ♦

Progress with the Motor Lifeboat.

Now, when the general interest in water automobilism is, by the recent experiments in high-speed boat building which we have chronicled recently, and the imminence of the approaching racing events, reaching a point of considerable intensity, it is appropriate that one of its most practical branches—the application of the petrol motor to the lifeboat—should be again brought before the public notice by the renewal of the experiments in this direction, which have been recorded from time to time. We refer, of course, specially to the trials made recently at Newhaven with a lifeboat fitted with a 10-h.p. internal combustion motor. These trials have been carried out during the winter months in very rough weather, which has enabled the motor lifeboat to be tested under the most severe conditions, and practically under exactly the same sort of circumstances it would have to encounter when employed for rescue from wrecks. The difficulties that have to be overcome in applying the motive power of the petrol engine to the lifeboat are, of course, considerably greater than are involved in the case of an ordinary motor boat. For one thing, the lifeboat is frequently flooded by heavy billows and breakers, and it is not at all unheard of for lifeboats to be actually capsized and to right themselves again on the way to a wreck. This, of course, involves a high degree of reliability on the part of the motor, as, under the circumstances, it is almost impossible to make any adjustments while running. It must also be of simple construction, so that it may not require a long apprenticeship on the part of the not usually highly-mechanical seamen who form our lifeboat crews. All these requirements are now, however, practically fulfilled by high-class petrol motors, and, taking this fact into conjunction with the successful experiments carried out at Newhaven, there can be no doubt that the petrol auxiliary motor will be very largely adopted in lifeboats in the near future. Needless to say, when this is the case, both the life-saving powers of

our lifeboats and their own safety will be greatly increased. Instead of the greater part of the energies of the crew being concentrated on propelling the boat, they will be, comparatively speaking, at liberty, and their numbers may consequently be reduced, with a corresponding increase of the life-saving capacity of the boat. Similarly, the manageability of a boat in rough weather is immensely increased by the "way" which motive power gives it, a circumstance which often enables tugs to approach a wreck more successfully than ordinary lifeboats. The internal combustion engine is triumphing so surely all along the line that there can be little doubt that complete success in this department also will be chronicled before long.

The Proper Sphere of the Electric Car.

THE best proof of how opportune was the business-like, concise and well-reasoned paper which Mr. Chambers read before the Automobile Club last week, on "The Future of the Electric Vehicle," has been shown by the extent to which the paper itself has been misunderstood by the general press. To many readers of the daily papers, it must have come as something of a surprise to learn that Mr. Chambers, whom they have probably regarded as one of the pioneers, and at any rate the present protagonist of the electric car, should be represented, when reading a paper on the subject, as pronouncing a funeral oration upon it, and adopting the attitude of Mark Antony, in his celebrated speech, that he had come to bury Cæsar, rather than to praise him. This, of course, is a ludicrous travesty of what Mr. Chambers actually said, and how it could have come to be promulgated at all is one of the many mysteries that modern journalism is constantly providing. The fact is, and this is the main lesson to be drawn from Mr. Chambers' paper, that it is just because the electromobile has found its true sphere of usefulness, that it has retired from competition in fields for which it was fundamentally unsuited. It is true enough that it has disappointed many hopes, but that, as Mr. Chambers points out, is because the hopes were very ill-founded. Chief amongst such hopes, of course, were roseate visions of regularly touring the country in electrically-propelled cars. From that field, owing to a variety of reasons, which it is hardly necessary to specify, the electromobile may be looked upon as having permanently retired, and on this point Mr. Chambers speaks with pre-eminent authority as one of the earliest pioneers of electric car touring, and the record holder for the principal long-distance electromobile runs in this country. But if the electric vehicle has retired from the country roads, it has retired that it may the more effectively assert its supremacy in towns, particularly in the Metropolis. The history of the last couple of years, in spite of financial *debacles* that would have paralysed any industry which did not possess a high degree of inherent vitality, goes to show that the demand for the electric vehicle, in London at any rate, is no mere temporary fashionable fad, but that its growth for town traffic has been gradually increasing, and that its future may be looked upon as reasonably assured. This is not, of course, equivalent to saying that electromobile garages or manufactories will ever in the near future show themselves Tom Tiddler's grounds, on which the company promoter will be able to pick up a golden harvest. But that is, perhaps, just as well for the industry. It is quite certain that as long as there are people who desire to be taken by self-propelled vehicles

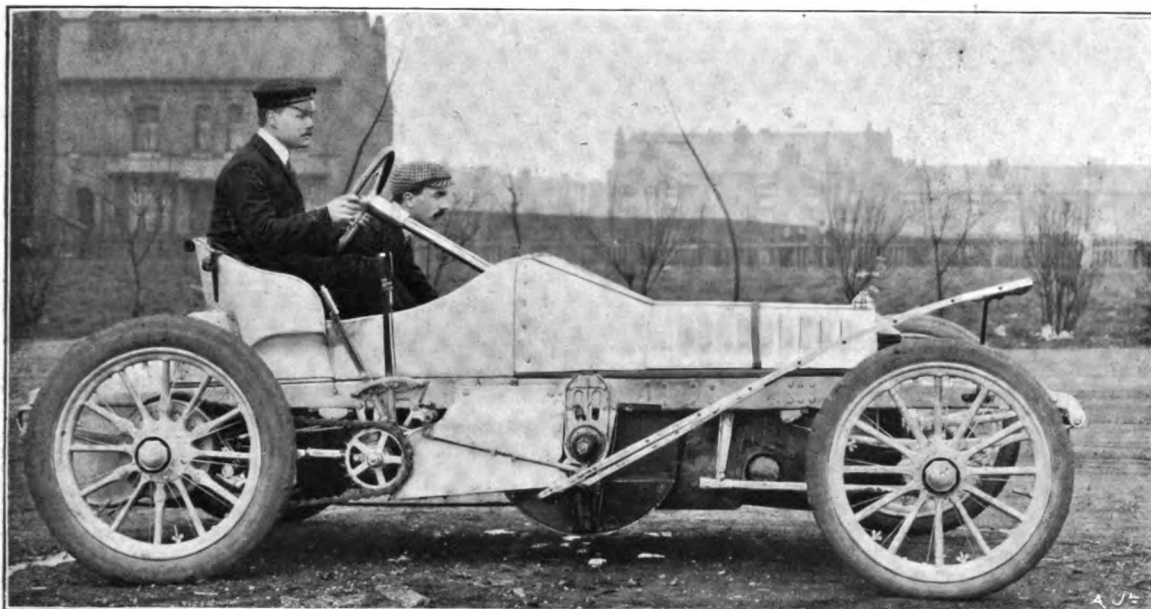
to theatres, parties, balls, and diversions of this kind, where their carriages have to wait long hours for them, to be ready to start in a moment and to thread their way with perfect ease and control through the crowded traffic of the Metropolis, the electromobile will always hold its own. Not the least among its good features is the readiness with which any intelligent coachman can be taught to drive it, and in the electromobile industry there is consequently no "driver difficulty" at all. At the same time, the necessity of providing charging stations has made the companies who deal in such vehicles cater for the convenience and comfort of their customers in a high degree, and for an inclusive charge per annum the owner of an electric carriage has all trouble taken off his hands. When, therefore, we notice the complete disappearance of the electric vehicle from our high roads, it is well to bear in mind that it is doing good work in our towns, and that specialisation of function of this kind is one of the best proofs of the real prosperity of all the different branches of a great industry.

Electric Delivery Vans Feasible.

CONSIDERING the great amount of attention that has been concentrated on the commercial vehicle problem recently, it is of considerable interest to note that Mr. Chambers is of opinion that light delivery vans for town use might be very successfully employed in all large cities where adequate electric charging facilities exist. It is, of course, mainly a question of cost, and it is on the cost of running, and the favourable figures which prolonged and organised practice have shown to be obtainable with electric vehicles, that Mr. Chambers bases his view. This is a view, too, which experience in America and France certainly seems to support. No one in this country, at any rate, is in a better position to form an opinion on the point than Mr. Chambers, as his company employs several electric chassis, carrying at times very considerable loads for use in connection with their garages. The electric delivery van will certainly have the advantage of being easy to drive—a very important point when any extended use of self-propelled delivery vans is considered. On the other hand, Mr. Chambers does not think it likely that the omnibus of the future will be electrically propelled. The conditions of light delivery-van work are quite different from those of omnibus service, the former resembling much more the kind of work to which a private brougham is put during the season. But the constant stoppage and re-starting under very heavy loads, which are among the principal difficulties of bus locomotion—as thousands of unfortunate horses know to their cost—would not suit the electric vehicle. On this point, indeed, there can be but little doubt.

THE Manx Legislative Council have passed a Bill for bringing the law in the island into uniformity with that prevailing in Great Britain. Considering the benefits which the automobile movement conferred on the island last year, the large number of visitors that were brought to it by arranging the Eliminating Trials there, and the extent to which the island was brought into general notice as a health and pleasure resort by the automobile Press in connection with that occasion, we think the Manx Legislature would have been well advised had they, instead of adopting the 1903 Act, shown the "predominant partner" what a sensible and liberal automobile law really ought to be.

THE 1905 WOLSELEY GORDON-BENNETT RACERS.

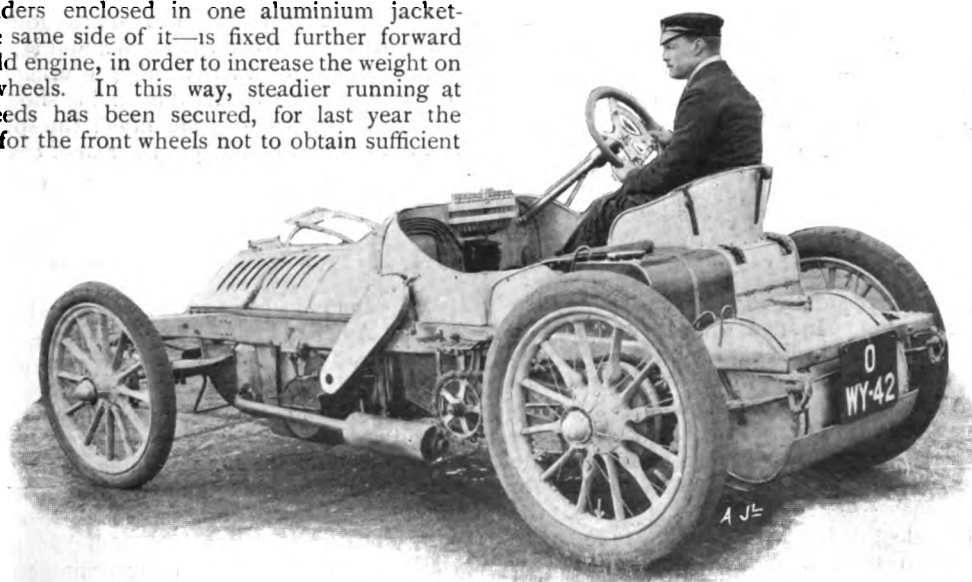


Side view of one of the 1905 Wolseley Racers, with Bianchi at the wheel.

Our illustrations show one of the two 90-h.p. Wolseley racers, which—apart from the Siddeley racer under construction for Mr. Lionel de Rothschild—will represent this Company in the racing world this year. Although nominally of 90-h.p., the 4-cylinder engine is considerably larger than last year. Otherwise, except for a few modifications, the vehicles are those which were known as the 96-h.p. cars of 1904. The engine, which has its nickel-steel crank-shaft carried in three bearings—with all four cylinders enclosed in one aluminium jacket-casting on the same side of it—is fixed further forward than was the old engine, in order to increase the weight on the steering wheels. In this way, steadier running at very high speeds has been secured, for last year the tendency was for the front wheels not to obtain sufficient

forthcoming Eliminating Trials, is seen seated at the wheel.

The engine has atmospheric inlet valves, a centrifugal governor acting on a throttle-valve, a hand-controlled throttle-valve, and a foot accelerator for cutting out the governor. The ignition system is of the high-tension type with accumulators; there is a fan immediately behind the radiator; the clutch inside the cast-steel fly-



View showing the rear portion of the 90-h.p. Wolseley Gordon-Bennett, Racer.

grip at the top speed attainable. It will be noticed, too, that the bonnet is flatter than before. In both views, Bianchi, who is one of the drivers selected for the

wheel has a leather cone face; and the gear-box, which gives four speeds, is provided with ball-bearings, and is given a three point suspension in the frame.

THE CROSSLEY-LEYLAND PETROL OMNIBUS.



The new 30-h.p. Crossley-Leyland Omnibus.

THE new omnibuses which are being constructed by the Lancashire Steam Motor Company, of Leyland, were referred to in our last issue, and we are now able to give a photograph of the first of these vehicles which has been supplied to the London and Suburban Omnibus Company. The vehicle is of the live-axle type, and is fitted with a 30-h.p. 4-cylinder Crossley engine. The Crossley internal expanding metal-to-metal clutch is also employed, but the gear-box is of special construction, and is rendered practically fool-proof. All the wheels for the three forward speeds remain in mesh, and the required speed is obtained by means of sliding jaw-clutches. A novelty in the arrangement adopted, however, is that a free-wheel clutch is employed in connection with the low speed, which thus takes up the load automatically when either the second or third speeds are thrown out. There are two change-speed levers at the side of the driver, that

on the outside having a neutral, a forward, and a "reverse" position only. The inner lever also works over a quadrant having three notches, and when in the middle position it gives the first speed. The other two notches give the second and third speeds, respectively, so that it is possible for the driver to drop down from the third speed to the first speed without passing through the second speed position.

Two universal joints (with a short shaft between them), are fitted between the propeller-shaft and the gear-box, and the propeller-shaft is enclosed in a tubular casing which is rigid with the back axle casing, and is supported at its front end by a spherical bearing securing it to the frame. The rear springs are carried in sliding shoes at both ends, and, as no radius rods are fitted, the spherical bearing, at the front end of the propeller-shaft casing, takes both the drive and the torque.



THEY do things apparently on somewhat peculiar principles in Accrington. In that town they possess an electric lighting concern, to which a contract for supplying current for electric tramways would doubtless come in handy. The Corporation of the town, after spending a large sum on the electrification of the tramways, turned its attention to the motor 'bus question. In order to procure an *unprejudiced* opinion on the situation for their guidance, they appear to have requested the chairman of the electric light undertaking to report to them his views on the motor 'bus question. This gentleman, needless to say, reports his conclusion that electric cars are much to be preferred. He adds further observations about speed, the smell of petrol, &c., and we are informed, in addition, that he is an experienced motorist. But the *argumentum ad pocketum* seems to have prevailed.

THE announcement which we recently made that the A.C. of America contemplated holding an exhibition of their own in New York next year, is now practically unofficially confirmed by Mr. A. L. Shattuck. It will probably be held in one of the National Guard armories.

AUTOMOBILE trading in India looks healthy. The shareholders of the Bombay Motor Car Company, Limited, we learn from the *Times of India*, have just been notified of a substantial dividend for their first year's trading. The profit, according to the directors' report, shows Rs.40,672 to the good upon a subscribed capital of Rs.90,000. A dividend has been declared of 25 per cent., Rs.7,000 carried to reserve fund, the remainder of the profits being devoted to the payment of agents' commission, and to writing off preliminary expenses, still leaving a balance to be carried forward.

THE 1905 HOTCHKISS CARS.—PART II.

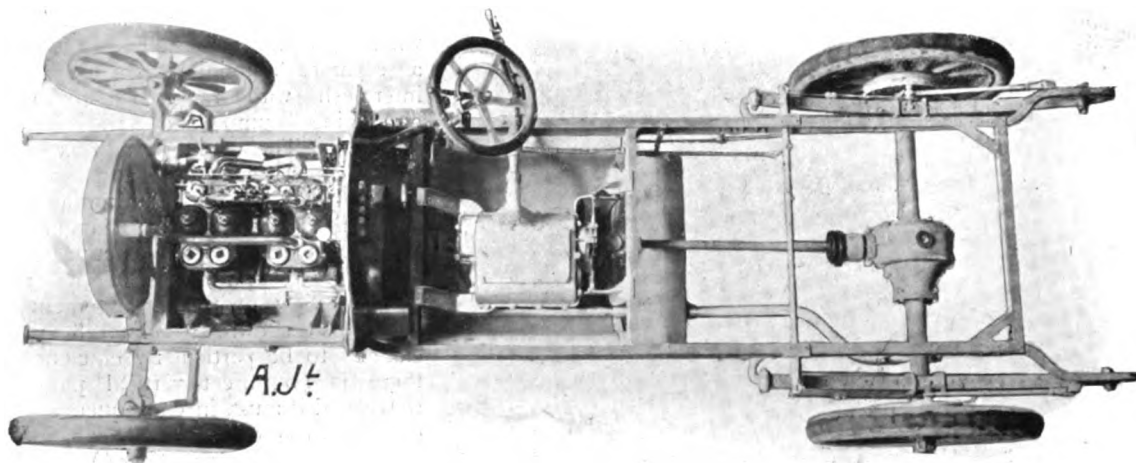


Fig. 2.—View from above of the 17-25-h.p. Hotchkiss Chassis.

THE chassis—shown from the side, from above, and from the front in Figs. 1, 2, and 3, respectively—is made in three standard lengths, suitable either for side entrance, tonneau, brougham, or wagonette bodies. The frame is of pressed nickel steel, narrowed in front of the dash to secure a wide steering lock for the front wheels, and is carried by semi-elliptic springs at the front and rear. The rear springs lie outside the frame, and, while their front ends are hinged, their rear ends are carried by shackles from very long dumb irons, as

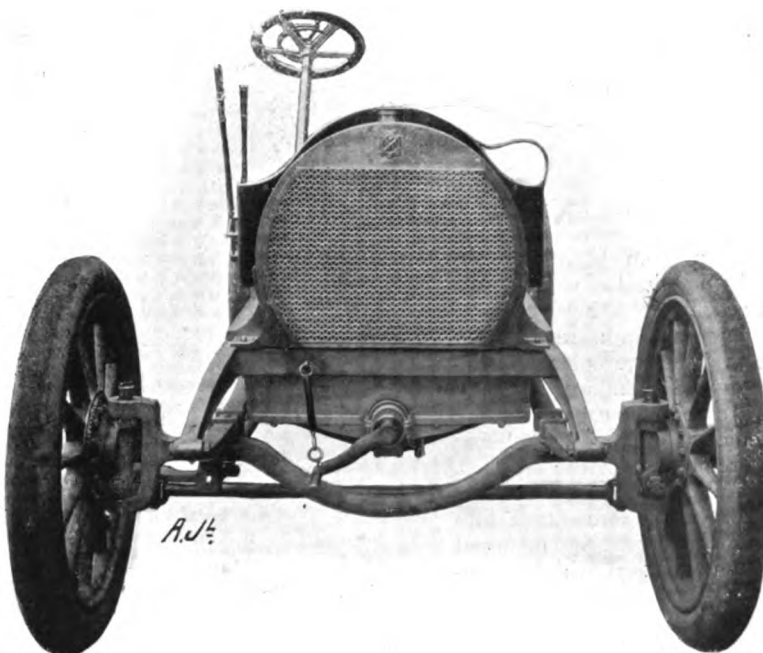
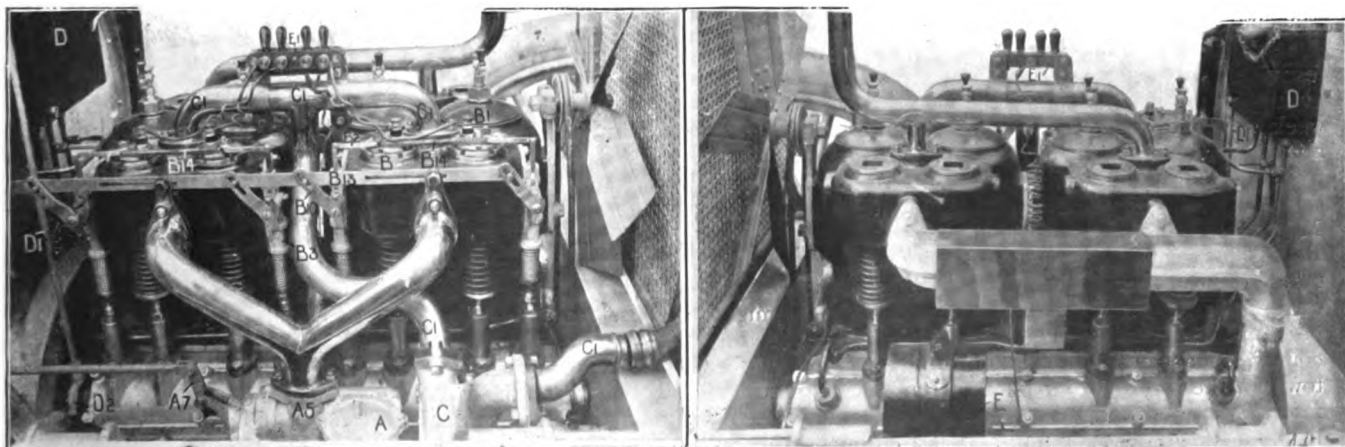
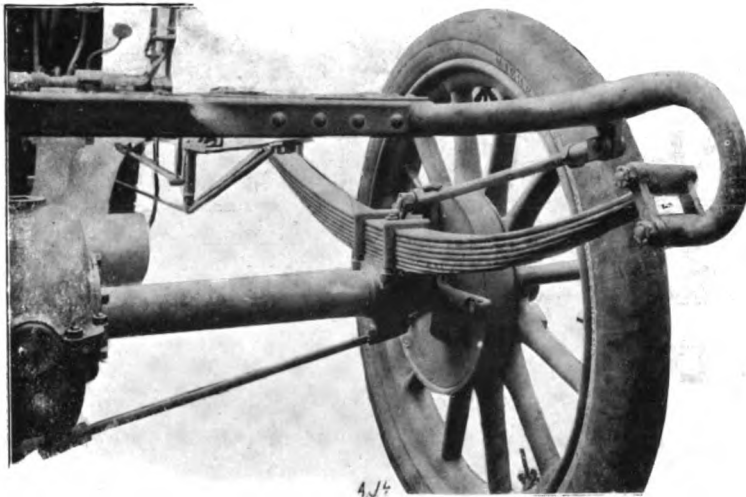


Fig. 3.—View from in front of the 17-25-h.p. Hotchkiss Chassis.

shown in Fig. 4. It will be noticed also that the short radius rods are hinged to the dumb irons, instead of being carried forwards and fixed to the side members of the frame. These radius-rods also form torque-rods, and, in addition, act as anchors for the expanding brakes on the rear wheels. The side-members of the main-frame are trussed, as shown in Fig. 1, there are four transverse cross-members of channel section between the two side-members, and the rear corners of the frame are stiffened by gusset plates, which are visible in Fig. 2.



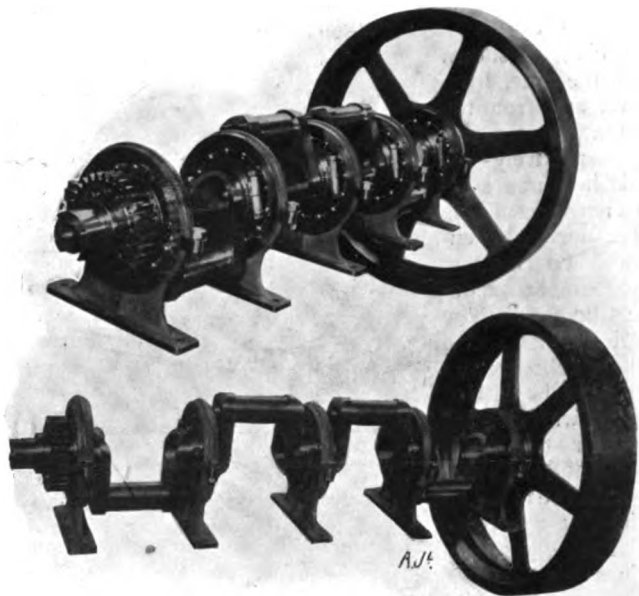
Figs. 5 and 6.—Views of the 17-25-h.p. Hotchkiss Engine from the Inlet- and Exhaust-valve sides, respectively.



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Fig. 4.—View of one of the rear springs on the Hotchkiss Chassis, showing the long dumb iron and the position of the radius-rod.

The front axle is bent downwards at the centre, and the forks for the steering-heads are forged in one piece with the axle. The steering-gear itself is of the screw-and-nut type, and the ball-and-socket joint, between the lower end of the steering-arm and the connecting rod, is arranged in such a way that it cannot become disconnected, should one of the buffer springs accidentally break.

The engine, which is seen from both sides in Figs. 5 and 6, is carried directly from the main frame, and has its four cylinders—the bore and stroke of which are 112 and 120 mm. respectively—cast in pairs. The valves are placed symmetrically on either side of the cylinder-heads, and are operated from their respective cam-shafts by vertical push-rods, ingenious cottar-pins being fitted to facilitate the removal of the springs. Large inspection-covers are arranged above the valves, and half-compression cocks are fitted into the cylinder-heads. The crank-shaft is mounted on ball-bearings, as shown in Fig. 7, which represents two views of a crank-shaft constructed for



INDEX
Fig. 7.—Two views of a Crank-shaft constructed for a 100-h.p. Hotchkiss Car, showing the arrangement of the Ball-Bearings.

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Brighton Motor Meeting.—The Brighton Town Council have now determined not only to expend the £3,500 which we mentioned last week for putting Madeira Road into perfect condition for the motor races, but have increased the amount to £4,000. All sorts of festivities are being arranged in connection with the event with the idea of making the meeting extend over a week. A military tournament in Preston Park is to be arranged by the officers of the 20th Hussars, there are to be a series of grand promenade concerts every evening during the week, and on Tuesday, July 18th, the Mayoress, Mrs. Blaker, will give a garden party at the Royal Pavilion. "There are others" whose ambition takes even higher flight. It is suggested in several quarters that their Majesties the King and Queen might be approached, through the Lord-Lieutenant of the county, to accept an invitation to be the guest of the town for the week, the Bedford Hotel being specially reserved for their use. As everybody is looking forward to the meeting, few people will be pleased by the appearance in the *Sussex Daily News* of a letter by a Mr.

a 100-h.p. engine. The crank-shafts on the engines of the touring cars, however, are not hollow as is that shown in Fig. 7. The gear-wheels for the cam-shafts are enclosed in a separate aluminium casing, and they intermesh with those which drive the circulating pump and the low-tension magneto. The cooling water is circulated by a centrifugal pump, and a belt-driven fan is fitted behind the radiator. The radiator is built up of triangular tubes, and forms one of the distinctive features in the external appearance of the car. A detailed view of the arrangement of the tubes is shown in Fig. 8 which is claimed to be particularly efficient because there is no direct vertical path for the water, and it must, in consequence, circulate over each face of the tubes.

(To be continued)

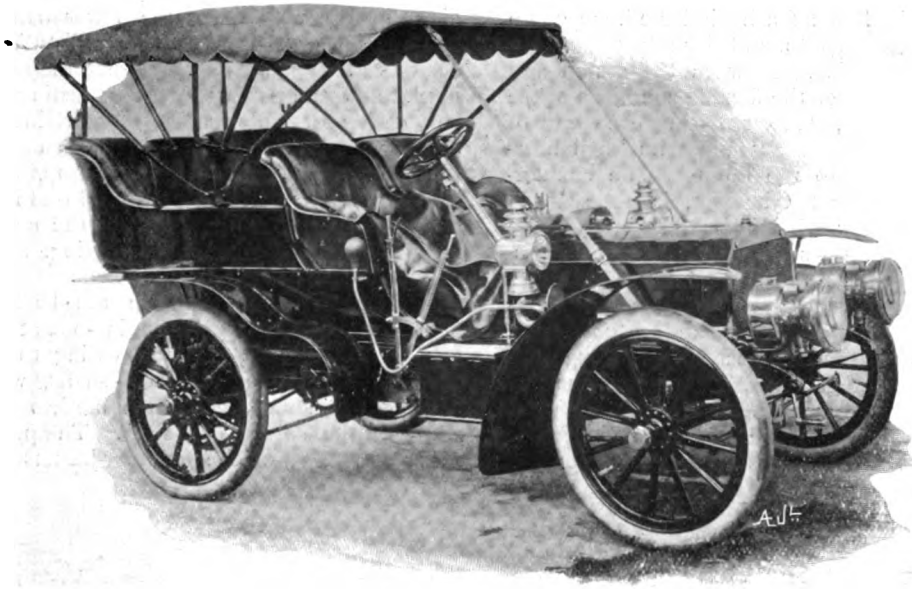
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Alfred Hallett suggesting that the whole meeting might be stopped by any ratepayer who liked to apply for an injunction. He would not do so himself, of course, but his letter rather suggests the old story of "Don't nail his ear to the pump." We hope this is not the interpretation to be given to Mr. Hallett's letter.

THE latest abomination to give attractiveness to which the name of the automobile has been borrowed (though, of course, the automobile is only a carriage with four wheels to it) is an infernal arrangement now being introduced in Paris in which a vehicle driven by a young lady runs violently down a steep place and is then kicked up into the air by a spring. The vehicle in this way is caused to turn a complete somersault, and when everything goes right, lands upon a continuation of the track, its occupant escaping with nothing worse than a shaking. It belongs to the class of performance the only attractiveness of which consists in its danger, and we have no sympathy whatever with it. Why it should be employed to bring the automobile into discredit is a mystery.

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THE NEW 35-H.P. BROOKE CAR.

(Continued from p. 342.)



One of the latest 15-20-h.p. four-cylinder Brooke Cars, built for Mr. Max Pemberton.

THE 35-h.p. chassis is shown from above in Fig. 1, and from the "off" side in Fig. 2, where it will be noticed that the engine is fixed direct to the side members, and that the gear-box is secured to two intermediate cross members of the pressed steel frame. The side members have a tapering cross-section, and the frame is carried on the usual side springs—those at the back being, in accordance with modern practice, arranged outside instead of beneath the frame. Both axles are strong forgings, and all four wheels are mounted on "Hoffmann" bearings, that have two rows of balls to take the load, and two other rows to take all end thrusts. The steering-heads, which have ball-thrust bearings at their upper ends, are formed by the bifurcated ends of the axle, and the two steering-heads are connected together

by a cross-rod that passes across behind, instead of in front of, the axle. With its wheel-base of 9 ft. 6 ins., and track of 4 ft. 6 ins., this vehicle should travel extremely smoothly, especially as the front axle lies well forward, and the frame is kept low by the arrangement of the rear springs. The rear tyres are 875 by 120 mm. and those in front are 870 by 90 mm.

Although the chassis was not quite completed at the time that our photographs were taken, yet it will be seen that the general arrangement of the various parts is the same as on most cars of the chain-driven type, and that the various parts have been carefully designed with a view to rendering everything as simple and accessible as possible. The steering-pillar passes through the dashboard, and the steering-gear lies to the right of the

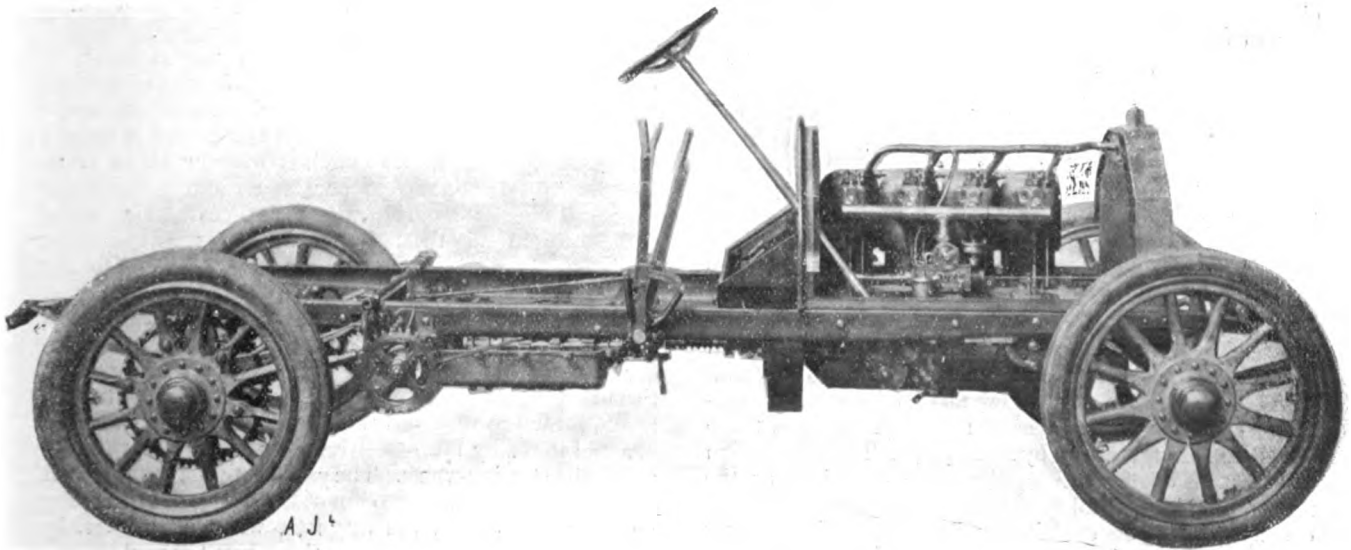
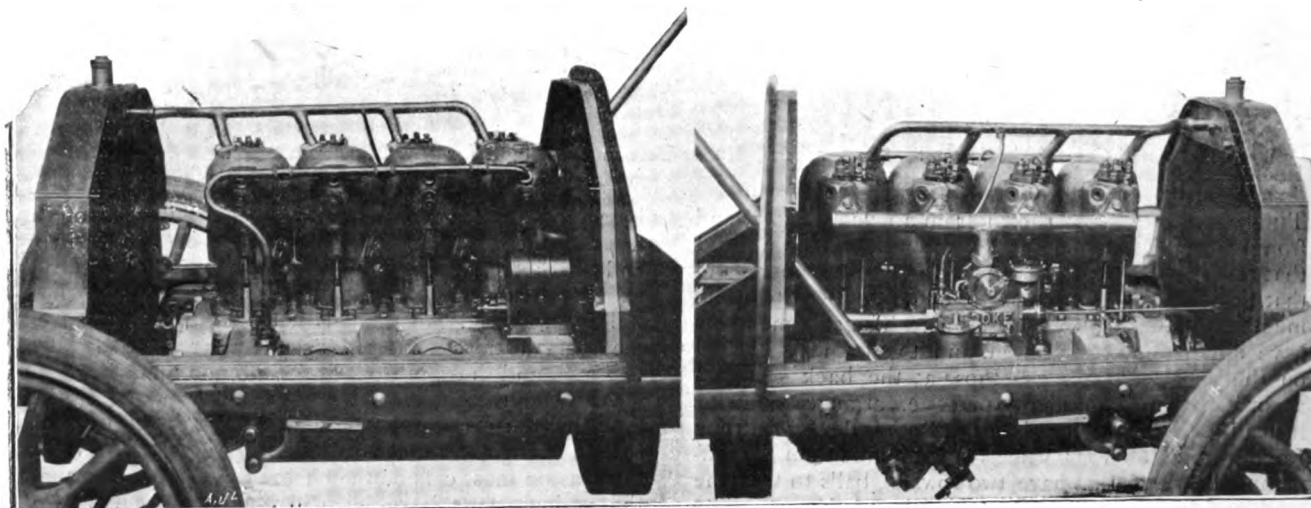


Fig. 2.—Side view of the 35-h.p. Brooke Chassis.

engine, this mechanism being of the worm and segment type, and thus practically irreversible. The finished chassis has a dust-proof casing beneath the driving mechanism, so that the fan-blades which form the spokes of the fly-wheel assist the chain-driven fan behind the honeycomb radiator in drawing the air into, and ejecting it from, the bonnet covering the engine. Between the clutch and the gear-box, is fitted one of the flexible couplings of the "Brooke" special pattern, and, supporting each end of the differential countershaft, are "Hoffmann" ball bearings, bolted and stayed to the frame. The countershaft brake, which is operated by foot, is not seen in Fig. 1, but the flange to which it is bolted—just outside the gear-box on the right—is visible. The side chains, moreover, were not fitted at the time, nor were the internal expanding brakes connected up with the hand-lever, that actuates them. These brakes are connected together by a flexible steel cable, that passes through the rock-shaft just behind the gear-box, and this rock-shaft is, in turn, coupled up by an adjustable rod with the shaft that carries the hand-lever. It will be noticed, in Fig. 1, that the last-mentioned shaft acts as a bearing for the

crank-chamber. The cylinder castings are bolted to the upper portion of the crank-chamber, and there are separate bearings for the crank-shaft between each of the four cranks, these bearings having caps fitted on the under side, in order to allow the lower half of the crank-chamber to be removed without disturbing the crank-shaft itself. The six feet, by which the engine is secured in place, form a part of the upper casting, and the necessary casing for enclosing the cam-driving gear-wheels is also formed by the same casting, with a detachable cover-plate in front. The circulating-pump, which is of the centrifugal type, is very neatly enclosed in the foremost supporting foot, on the left side, the cylindrical casing for it being a part of the main casting, though the pipe connections are made to the removable end cover that is screwed up in place from the back. The pump-spindle projects through a stuffing-box at the front side, and passes through into the casing that encloses the gear-wheels driving the cam-shafts, where it is provided with a spur-wheel which meshes with the larger wheel on the exhaust cam-shaft. The pump delivers the water into each of the cylinder-jackets just above the



Figs. 3 and 4.—Views from the left and from the right sides, respectively, showing the 35-h.p. Brooke engine fixed in place in the chassis.

change-speed-lever, with its sliding sleeve, and that it is neatly carried by brackets fixed to the cross-member of the frame that lies in front of the gear-box. Fixed to the back of the chassis is the petrol tank, from which the fuel is fed under pressure to the carburettor.

The Engine.

The engine is shown from either side, fixed in place in the chassis, in Figs. 3 and 4, and its construction is shown by line drawings in Fig. 5. Its cylinders are formed by separate castings, with the inlet-valves on the right side, the exhaust-valves on the opposite side, and large water jackets surrounding the entire heads. Immediately above the inlet-valves, are fitted low-tension igniters, and, through the walls of the same valve-chambers, holes are bored and tapped to receive high-tension ignition-plugs if needed; usually, however, these holes are merely stopped by screw plugs. The low-tension igniters are operated from the same cam-shaft as the inlet-valves, by vertical rods passing through the cylinder castings, as will be explained presently, provision being made, in an ingenious manner, for varying the time of ignition. Both the cam-shafts lie inside the aluminium

exhaust-valves, and the water passes out from each cylinder-head slightly to the right of the centre.

The fan, that is mounted behind the radiator, is driven by a chain, instead of a belt, from the engine, and, in order to relieve it of such shocks as would otherwise be imposed upon it when the engine is slowed up quickly, a free-wheel clutch is introduced, to allow the fan and the chain to continue running until the friction of their own bearings reduces their speed sufficiently to suit that of the engine, or brings them gradually to rest after the engine has stopped. On the front end of the exhaust-cam-shaft, is fitted a centrifugal governor, which acts upon one of the throttle-valves in the carburettor, subject to the control of a foot-accelerator; but the carburettor, of which further particulars will be given presently, has a hand-controlled throttle-valve as well, and the former, as well as the latter, is acted upon by the small hand-lever which is placed above the steering-wheel. The carburettor lies to the right of the engine, and, on the opposite side—just behind the dash-board—is fixed the magneto, which is driven by gear-wheels off the rear end of the exhaust-cam-shaft.

(To be continued.)

THE THORNYCROFT LURRIES, OMNIBUSES, AND VANS.—PART II.

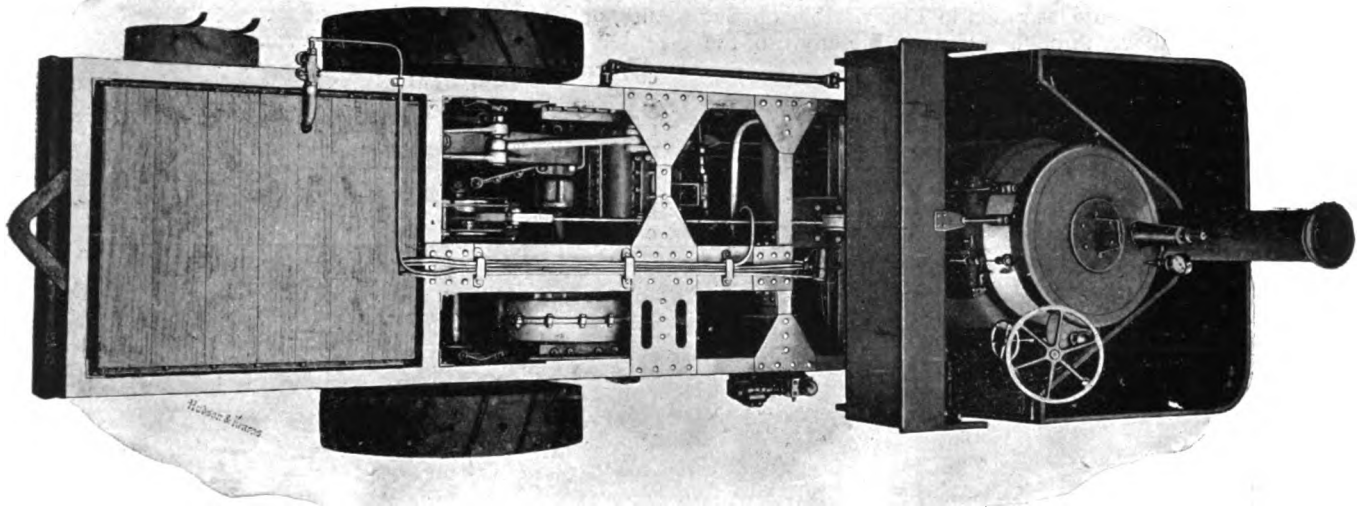


Fig. 1.—View, from above, of the 5-ton Thornycroft Colonial Steam Wagon, which has a water-tube boiler, a 45-h.p. engine, turn-table steering, and enclosed transmission gear.

ANOTHER special feature that is of great importance on the Thornycroft petrol commercial vehicles is that the same multiple-disc friction-clutch which is used on their touring cars is adopted, this clutch tending to save the transmission-gear from being damaged by careless driving, in much the same way that the "spring-drive" does so.

The 2-ton lorry, and the 'bus, chassis are of the live-axle type, with a single-chain drive from the change-speed-gear. When intended for lorry work, the chassis has the makers' 20-h.p. engine, and is geared to about 8 miles per hour; but, for 'bus work, the 25-h.p. engine is used, and a speed of about 12 miles per hour can be attained at normal engine speed. Either single-deck or double-deck 'bus bodies are fitted. The standard 1-ton chassis—which was primarily designed for a tower wagon and is geared to about 14 or 15 miles per hour—is also fitted with the 4-cylinder 20-h.p. engine, but it has an entirely different form of transmission mechanism. The rear wheels are

driven by pinions on a differential countershaft, the pinions meshing with internal gear-rings fixed to the road wheels. This chassis is also used for the special car that has been built for the British Vacuum Cleaner Company, in which the cleaning plant is driven by the same engine that propels the vehicle, and the body has seating accommodation for five persons. A 10-cwt. light delivery van, having a 2-cylinder engine, is also constructed.

The Thornycroft Steam Wagons.

It will be remembered that the 5-ton Colonial wagon, and the 4-ton standard wagon, of which we give views in Figs. 1 and 4, from above and from beneath respectively, are fitted with water-tube boilers, and that the chief differences between them are only such as are necessary to meet the varying requirements of users abroad and at home. The Colonial model has a 45-h.p. engine instead of one of 30-h.p., the whole of the transmission-gear is enclosed in neat casings, instead of being exposed, and another important difference is that the front axle is mounted on a turn-table for steering, instead of having the usual Ackermann system, with steering-heads at each end of the axle.



Fig. 2.—The new, 5-ton Thornycroft Standard Wagon, which has a locomotive-type boiler, a 45-h.p. engine, "Ackermann" steering, and can haul a total load of about 8 tons.

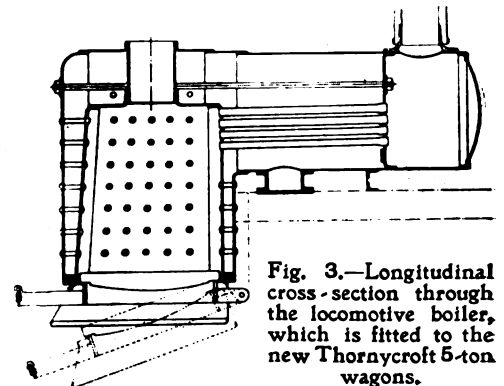


Fig. 3.—Longitudinal cross-section through the locomotive boiler, which is fitted to the new Thornycroft 5-ton wagons.

The new 5-ton wagon, which conforms with the Local Government Board regulations, and can therefore be used on ordinary English roads, is shown in Fig. 2. It has a specially constructed type of locomotive boiler, of which we give an illustration in Fig. 3. This boiler is fired from above, through a door in the crown of the

fire-box, and there are 38 tubes leading from the fire-box into the smoke-box. The heating surface is 75 sq. ft., the grate-area 4 sq. ft., and the fire-bars are mounted in a frame that enables them to be lowered for drawing the fire, or for facilitating cleaning.

(To be continued.)

THE WOLSELEY INDUSTRIAL VEHICLES.

(Continued from p. 354.)



The Wolseley Single-deck Petrol 'Bus, which has a two-cylinder 20-h.p. horizontal engine, and accommodates 22 passengers in all—16 inside, 4 behind the driver, and 2 beside him.

In connection with railway work, the very successful running of the petrol-electric coaches on the North-Eastern Railway have led other railway companies to adopt somewhat similar systems. At the present time, for instance, the Wolseley Company are completing a powerful 6-cylinder engine, which is to be used on one of the American railways, and of which we shall give particulars, in due course, presently. Apart from this very heavy railway work, however, small locomotives, for running on narrow-gauge lines, in large works and in other places, are being built for hauling heavy loads, and another entirely distinct field that has received a good deal of attention from these makers is the construction of tram-cars driven by petrol engines.

Another very important development in connection with this industrial vehicle work, has been in connection with vaporisers for enabling the firm's engines to use ordinary lamp oil, or other cheap grades of fuel, instead of petrol. Sufficient has been done in this direction to enable them to supply engines of this kind, and, in fact, the military transport lorry, of which we gave an illustration last week, is, amongst other existing vehicles, so fitted.

These numerous different types of industrial vehicles—combined with the other important branches of the Company's automobile business—involve the construction of about twenty entirely different sizes of engine, and about double that number of types, to suit all the

necessary purposes. The range of work to be performed by them is so extensive that they vary from those having a single cylinder, up to those of 16 cylinders, and the power developed ranges from that of the small 4-h.p. motor up to about 800-h.p. For the commercial vehicles they are all of the horizontal type, but for boat work—and for some of the pleasure cars—they have vertical cylinders.

The Military Transport Lorry.

As will be seen from our illustration, this military wagon has a very substantial channel frame, and, in outward appearance, is very similar to many of the steam luries that are so familiar to our readers—this resemblance being still further emphasised by the chimney that is employed for the exhaust gases. Both axles are carried between horn-plates, with semi-elliptic side springs above the back axle, and with a transverse spring above the front axle. The frame is thus given a three-point suspension, and the front axle is allowed sufficient play to enable either of the steering-wheels to surmount obstacles of up to a foot in height without unduly straining the frame. The steering-gear is arranged on the Ackermann principle, with very substantial steering-heads at each end of the axle, and is irreversible. The wheels are constructed throughout of steel; those at the back are about 4 ft. 6 ins. in diameter, and have a 12-in. tread, while those in front

are about 3 ft. 6 ins. in diameter, with a 9-in. tread. The wheel-base of the vehicle is 12 ft. 6 ins., the track is about 6 ft., and the platform—which is 4 ft. from the ground—has an area of 80 sq. ft.

The 40-h.p. horizontal engine is fixed beneath the frame, with its four cylinders projecting forward. It is connected by a silent chain—the slack side of which runs over a jockey-pulley—with the change-speed-gear. Both the engine and the gear-box thus lie beneath the level of the platform, and both are readily accessible. The engine runs at a normal speed of 600 revs. per min., and, as already stated, the bore and stroke are 6 ins. and 7 ins. respectively. A special form of vaporiser is fitted to allow the engine to use ordinary petroleum, instead of petrol, and the fuel consumption is approximately 3 gals. per hour, when the vehicle is maintaining its average speed of 5 miles per hour on full load; the fuel-tank furnished on the car has a capacity of 100 gallons.

The cooling-water is circulated through the jackets by the pump that, as usual, forms a part of the engine, and it is cooled by a large radiator fitted in the front of the vehicle. The air is drawn through the radiator by a belt-driven fan, fixed just behind it, and the water-tank lies at the back of the frame. The engine is, as usual, fed with oil by gravity from a lubricator placed in full view of the driver, and all the regulating levers and

pedals are conveniently placed inside the "cab" in front. The ignition system adopted is of the low-tension magneto type.

In the gear-box, the sliding spur-wheels are carried on a first-motion-shaft, and the wheels with which these engage are on a second-motion-shaft, while the latter shaft drives a differential countershaft, which passes through the gear-box and carries sprockets at its extreme ends for the side-chains. The sliding-wheels are, as usual, controlled by a cam-drum, operated by a single change-speed-lever; the four forward speeds represent 1, 2, 5, and 8 miles an hour, respectively, and the "reverse" is equivalent to 2-m.p.h. Carried on the projecting end of the first-motion-shaft—instead of upon the engine crank-shaft—is the main clutch, and this has metal-to-metal friction surfaces.

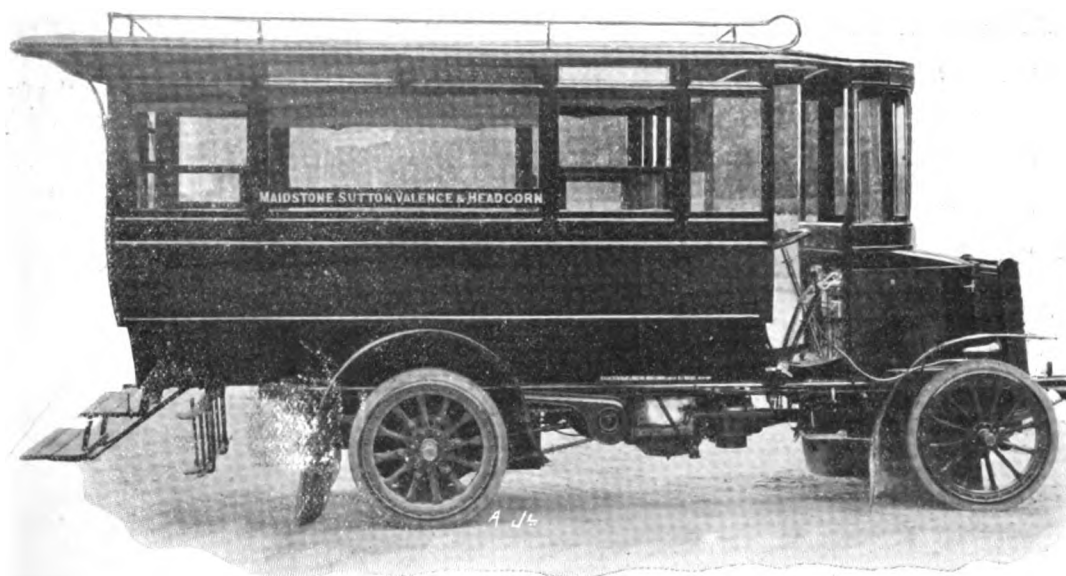
Two separately operated pairs of brakes are provided, both of which have metal friction surfaces, are compensated, and are double-acting. The one pair of brake-drums are fixed to the two ends of the differential countershaft, just inside the sprocket-wheels, and the other two are of the internal shoe type, and lie inside the large chain-wheels on the road wheels. As already mentioned, the vehicle weighs about 6 tons unloaded, and is capable of carrying and pulling a total load of about 8 tons.

(To be continued.)



THE LATEST CLARKSON STEAM 'BUSES.

(Continued from page 356.)



A Single-deck Clarkson Steam 'Bus, with accommodation for 16 passengers, and with luggage capacity on the roof for from 5 to 10 cwts.

THERE are, of course, numerous places in which, and a number of purposes for which, single-deck 'buses are required, so that the new double-deck model in no way replaces the earlier type, but enables the makers to meet the entire demand in all localities, instead of only being able to supply a comparatively small type. The larger vehicle accommodates 34 passengers, but, owing to the adoption of a new system, is not as large in comparison as it otherwise would be, for the driver's seat is placed

up above the boiler, instead of behind it, and thus the overall length of the main frame is considerably reduced. Of the details of its construction, we shall have more to say presently—after having dealt with the chassis that is now employed for the single-deck 'buses—but, before passing on to the improvements that have been made in the earlier model, it might be mentioned that the double-deckers have a semi-flash type of boiler, that the chimney is dispensed with by the adoption of a down-draught flue,

and that either a two-cylinder or a four-cylinder engine can be fitted at will.

The special features of the small chassis, which is not only suitable for single-deck 'buses, but also for touring vehicles of various kinds, are that the burner, which uses ordinary lamp oil, is automatically controlled by the steam pressure as well as by hand, that the engine and the transmission-mechanism is completely enclosed and has all its moving parts automatically lubricated by a mechanical pump, that the main pistons and the piston-valves have floating rings of ingenious design, that the piston-rods and the valve-rods have no stuffing-

they are remarkably accessible at any time. An automatic feed-water system is also fitted, when required,

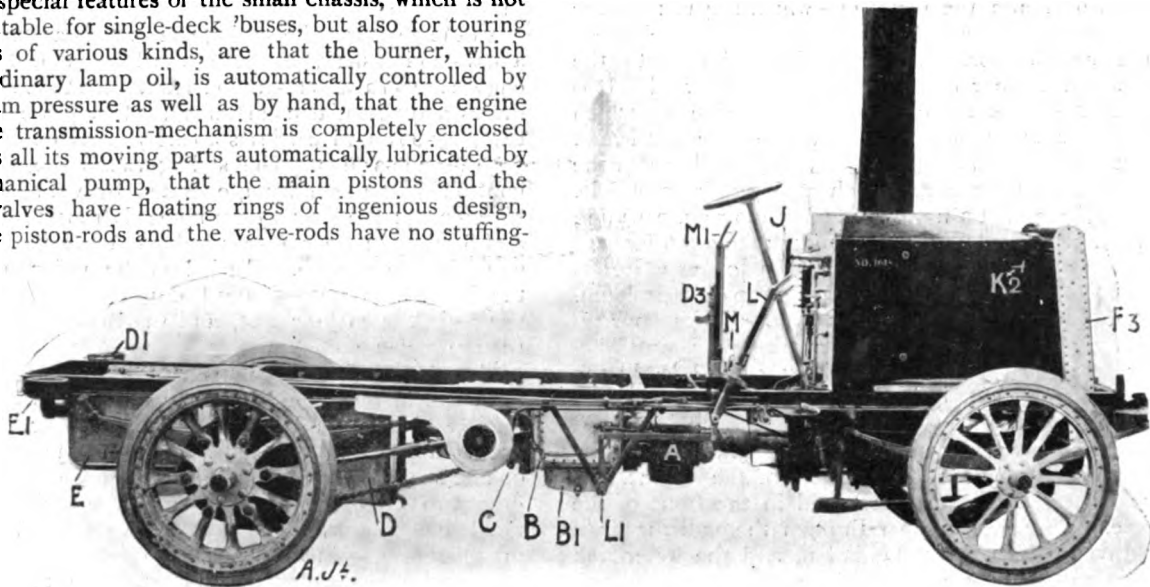


Fig. 1.—Side view of the Clarkson Steam Chassis, of the type constructed for single-deck 'buses and for touring vehicles.

boxes in the ordinary sense, and that all the pumps—which have interchangeable parts—are fitted with easily-renewable metallic packing rings instead of with glands, and have their valves arranged in such a manner that

and, as we have already said, the most important—and most recent—improvement is that the boiler tubes are welded in place, instead of being expanded as formerly.

(To be continued.)

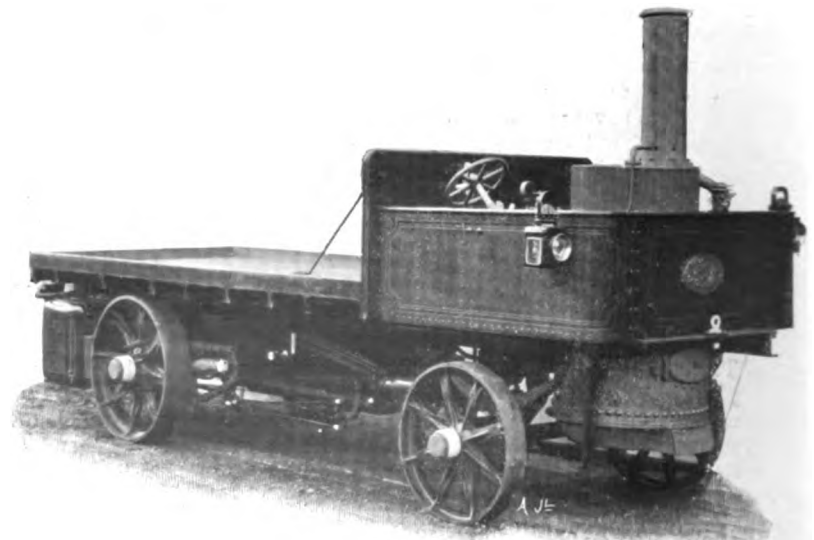


THE GARRETT STEAM LURRY.

SEVERAL unusual features are embodied in the industrial vehicles manufactured by Garrett and Sons, of Leicester, although in appearance it does not differ from the ordinary type of steam lurry. The engine, which is of the compound type, is non-reversing, and the link motion is consequently dispensed with; a reverse is, however, provided by means of sliding spur-wheels. Another special feature is the controlling valve, which is operated by the driver, so as to either compound the cylinders for normal running, to admit high-pressure steam to both cylinders for starting, or to close the exhaust from the high-pressure cylinder, in order to use the engine as a brake. At the same time that the high-pressure steam is admitted to the low-pressure cylinder for starting, a port is opened to pass the steam from the high-pressure cylinder direct to the exhaust pipe; in this way the full benefit is derived from the admission of high-pressure steam to the low-pressure cylinder, and the advantage is not merely that due to the difference of area between the high and low-pressure cylinders, as is the case with the arrangement adopted on some vehicles.

The boiler is of the vertical fire-tube type, and is top fired: the feed water is heated by the exhaust steam from the engine: and the exhaust steam itself is dried before it is passed to the atmosphere through the smoke stack. The engine lies horizontally under the main frame, which is of channel steel, and is bolted to a gear-box which encloses the change-speed and differential gears. Both engine and gear-box,

which form one piece, are carried from the frame by a three point suspension, and the rear wheels, which are steel castings, are driven by side chains. The frame is carried by semi-elliptic springs, and those at the rear are free to slide in shoes, adjustable radius-rods being used to tie the rear-axle to the frame. Internal expanding brakes are fitted to the hubs of the rear wheels, and these are operated by a foot-pedal. The usual tyre brakes are also fitted, and are operated by a hand-wheel from the driver's seat.



The 4-ton Garrett Steam Lurry.

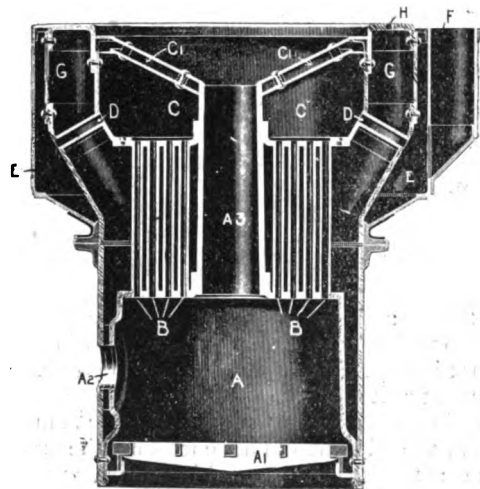
THE 5-TON HERCULES STEAM LURRY (Concluded.)



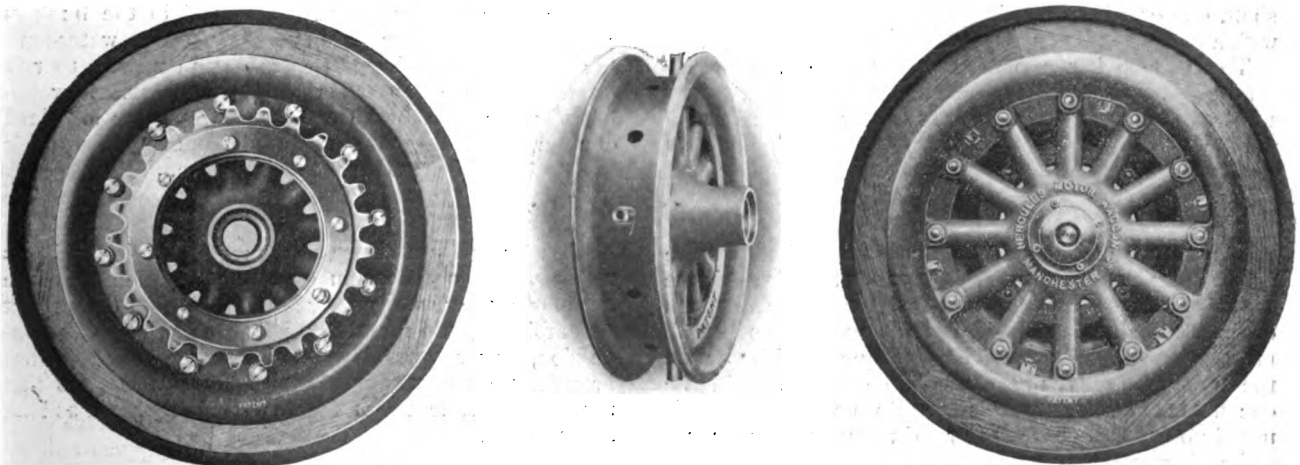
Side View of the Hercules 5-Ton Steam Lorry.

It will be noticed that the boiler is constructed with joints so that it can be taken apart when necessary for cleaning, and that it is quite a simple matter to remove the cover, C', for getting at all the tubes.

The engine employed is of the 2-cylinder, compound type, and is arranged in such a way that both cylinders can be supplied with high-pressure steam when required, and that this emergency device can be operated from the driver's seat. Each cylinder then has a separate exhaust, so that all back pressure on the h.p. piston is avoided. A very ingenious automatic relief-valve is employed for allowing any water to escape from the cylinders, and for, therefore, preventing any damage from being done, as is possible on some cars if the driver forgets to open the ordinary drain-cocks. The valves are held up in place by the steam pressure, so that no springs of any kind are required, and the steam then acts upon a larger area than that on the other side of the valve, with the result that it is impossible for the valve to open when the engine is working, unless the pressure in the cylinder



Vertical Cross-Section showing the Construction of the Hercules Boiler.



Three Views of the Hercules Composite Wheels, showing a complete wheel from both sides, and the central steel portion separately.

exceeds that in the steam pipe. Another point is that, when the engine is at rest, the valves can drop off their seats, and thus allow any water that may form to immediately escape.

Between the crank-shaft and the differential counter-shaft, is introduced a two-speed gear, which is so operated

that no internal fork clutches are required, and the differential-gear has a locking device for use in case of emergency, compelling the two driving wheels to revolve together. The usual engine-driven pump and injector are provided, and the rear wheels are fitted with powerful brakes.



THE LONDONDERRY STEAM WAGON.

THE 5-ton luries now being built by the Seaham Harbour Engine Works differ in several important respects from the 4-ton vehicles that we described in April last year, one important difference being that a fire-tube boiler instead of a water-tube boiler is employed, and another is that the engine is of the compound type instead of having two high-pressure cylinders. The rear axle is driven by gearing from an intermediate counter-shaft, and this mechanism is arranged in a special manner so that the gear-wheels remain properly in mesh

special type made of teak, and the latter—being cast—have no rivets or joints of any kind.

The boiler, which is fixed in front, as seen in our illustration, has a heating surface of 95 sq. ft., and a grate area of $3\frac{1}{2}$ sq. ft. The entire ash-pan, together with the fire-bars, can be lowered and raised for facilitating cleaning, and the smoke-box is rendered easily detachable to enable the tubes to be exposed, for cleaning, without disconnecting any steam fittings. The boiler fittings, which are of gun metal, can be dismantled, if necessary,

while the boiler is under steam, and a working pressure of 200 lbs. per sq. in. can with safety be maintained.

The boiler is fed with water from a low-speed pump, that is driven by gearing from the crank-shaft, but an injector is also available as well. The water passes through a feed-water heater, by which the exhaust steam is made to raise its temperature to about 180° F. The horizontal compound engine has its slide-valves



The 5-ton Londonderry Steam Lurry, which now has a fire-tube boiler.

at all times, and that the rear springs are given free play. For this purpose, the axle is carried in axle-boxes that work in curved slots in the steel framing, the slots being cut at a radius from the centre of the countershaft. The main frame is constructed of channel steel, and to it, the oil-tight casing enclosing the crank-shaft and the countershaft is secured in such a way as to be self-aligning. As usual, two alternative gears—equivalent to $5\frac{1}{2}$ and $2\frac{1}{2}$ miles per hour respectively—are available, there being two sliding pinions on the crank-shaft, one or other of which can be brought into mesh with a corresponding spur-wheel on the countershaft.

The vehicle has a platform area of 12 ft. 6 ins. by 6 ft. 3 ins., and its wheels are 3 ft. 3 ins. in diameter by 10 ins. wide, and 2 ft. 9 ins. in diameter by 6 ins. wide, at the rear, and in front, respectively. Wood wheels or steel wheels are fitted, as desired, the former being of a

operated by a special mechanism, with a single eccentric, which gives a variable cut-off and a constant lead. The high-pressure cylinder has a bore of $4\frac{1}{2}$ ins., the bore of the low-pressure cylinder is 7 ins., and the stroke of both is 6 ins. Provision is made for admitting high-pressure steam to both cylinders if required, in case of emergency at any time. The cylinders, as well as the valves, are automatically fed with oil by a pump lubricator, and the moving parts are entirely enclosed in a casing in which they feed themselves with oil on the splash principle.

About 4 cwt. of coke can be carried in the bunkers alongside the boiler, and the capacity of the water-tank (220 gallons) is sufficient to enable the vehicle to run distances of over 20 miles without re-filling. A water-lifter, with 30 feet of hose, forms part of the standard equipment. These wagons are guaranteed to carry their full load of 5 tons up gradients of 1 in 9.



THE London County Council has decided to provide a motor car at the expense of £450 for the Fire Brigade to inspect the streets and buildings. One of the members of the Council, evidently of a suspicious frame of mind, moved that the car should be fixedly embellished with the monogram of the Council, so that should he encounter the vehicle at Ascot or Epsom, where little is usually burnt except the fingers of the unwary, he could claim his right as a councillor to drive back on it.

THE human mind is so constructed that it is always rediscovering old chestnuts—a remark which we make apropos of the recently revived discussion on the subject of employing tar for allaying dust on roads. The discussion, however, has had one interesting result—it has brought up a correspondent who stoutly maintains that the first experiment with tar was tried in Algeria as long ago as 1888.

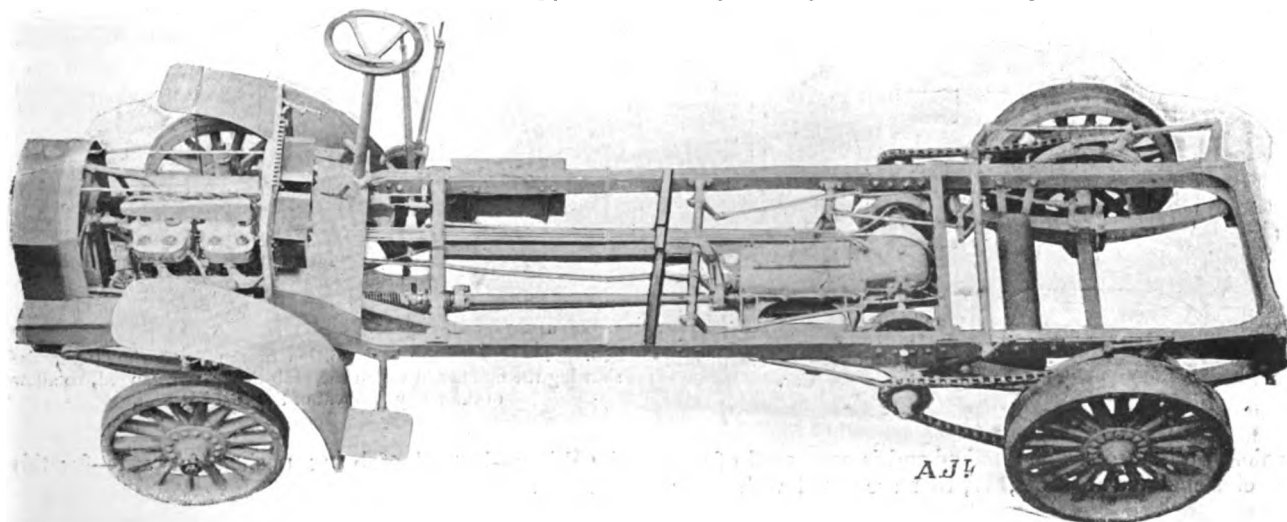
THE DURKOPP PETROL OMNIBUSES.



View of one of the Durkopp Petrol Omnibuses supplied by the Motor Car Emporium to the London Road Car Company.

AMONG the motor omnibuses now running on the London streets are the Durkopp vehicles—supplied by the Motor Car Emporium to the London Road Car Company—of which we give two photographs, one illustrating a complete 'bus and the other a view of the chassis taken from above. These vehicles are of the chain-driven type and are fitted with four-cylinder engines capable of developing 30-h.p. The frame is, as will be seen from our illustrations, of considerable length, but the wheel base has been somewhat shortened by allowing the bonnet to overhang the front axle. The semi-elliptic springs lie underneath the frame at both ends, and those at the rear pass below the axle. The rear springs are carried from shackles at both ends and adjustable radius-rods tie the back axle to the frame. The frame is narrowed in front of the dash to secure a wide steering lock, and the engine and gear-box are carried by an under-frame which is supported

by transverse cross-members from the main-frame. The engine has its four cylinders cast in pairs with the mechanically-operated valves arranged symmetrically on either side. The cooling water is circulated by a gear-driven pump, and a belt-driven fan is arranged behind the large radiator which forms the front of the bonnet. The clutch is of the ordinary cone type, and the power is transmitted through a very long propeller-shaft to the gear-box, in which the second-motion-shaft is arranged immediately above the first-motion-shaft. A number of independent lubricating pipes are carried to the gear-box bearings, and their neat arrangement is clearly indicated in our photograph of the chassis. Very large band-brakes are fitted to the rear-axle and they are operated, through a compensating device, by a side lever. A band-brake is also fitted to each half of the differential countershaft, and these are interconnected through a compensating device with a foot pedal.



View, from above, of the 30-h.p. Chassis for the Durkopp Omnibus.

THE 20-H.P. BROTHERHOOD

PETROL CAR.—PART VIII.

THE BRAKES.

THE foot-operated brakes, on the ends of the differential-countershaft, and the hand-actuated brakes, on the hubs of the rear-wheels, are all practically of the same design, as will be seen by comparing Fig. 35 with Fig. 36. Fig. 35 not only gives a view of the end of the countershaft, complete with its brake-drum and sprocket, but also includes other views that show it with the sprocket removed, and then with the brake-drum also removed. Fig. 36 is a side view of the rear end of the frame, and in it the brake-band is shown attached to the

(Conclusion.)

renewable metal liners, and are pivoted to the stationary pins, E^4 , which take the strain when the brake is applied. The shoes are normally held apart by the spring, E^5 , which is fitted between their projecting ends, and this spring lifts both shoes quite clear of the brake-drum, as soon as the pressure pulling them together is released; their other ends are engaged by the two links, E^6 , which are carried by the pins, E^7 , that project from the operating rock-shaft, this rock-shaft being connected with the steel cables that apply the brakes. In Fig. 36, it will be noticed that the lever, E^8 , is fixed to the inner end of the rock-shaft, but, in Fig. 35, the corresponding lever is not seen.

All the brake-drums have flat faces, instead of being provided with side flanges, so that they can be removed—together with the wheels to which they are fixed—and it is not necessary to disconnect the brake-bands before doing so. It will be noticed, too, that the shoes can be made to fit accurately around almost the entire periphery of the drums, and that therefore a very powerful action is obtained, without there being any tendency for side-strains to be imposed upon the shaft; ultimately, moreover, when the metal liners have been much worn, it is a simple matter to replace them. The links, E^6 , provide for a considerable range of motion, and an adjustment is available in the compensating steel cables, but the extent to which the shoes are allowed to clear the drums can be controlled by tightening up or slackening the bolts that pass through the springs, E^5 .

In Fig. 35 is seen the simple manner in which the countershaft brake-drums and the sprocket-wheels are secured in place, for it will be noticed that a star-shaped boss, P , is secured to the shaft itself, and that the sprocket and the brake-drum, E^9 , are in turn bolted to it. These two parts register on either side of the arms of the boss, and are held in place by four bolts. As has already been said, the countershaft brakes are controlled by the same pedal that operates the clutch; the hub-brakes are actuated by the hand-lever, E , which is pulled towards

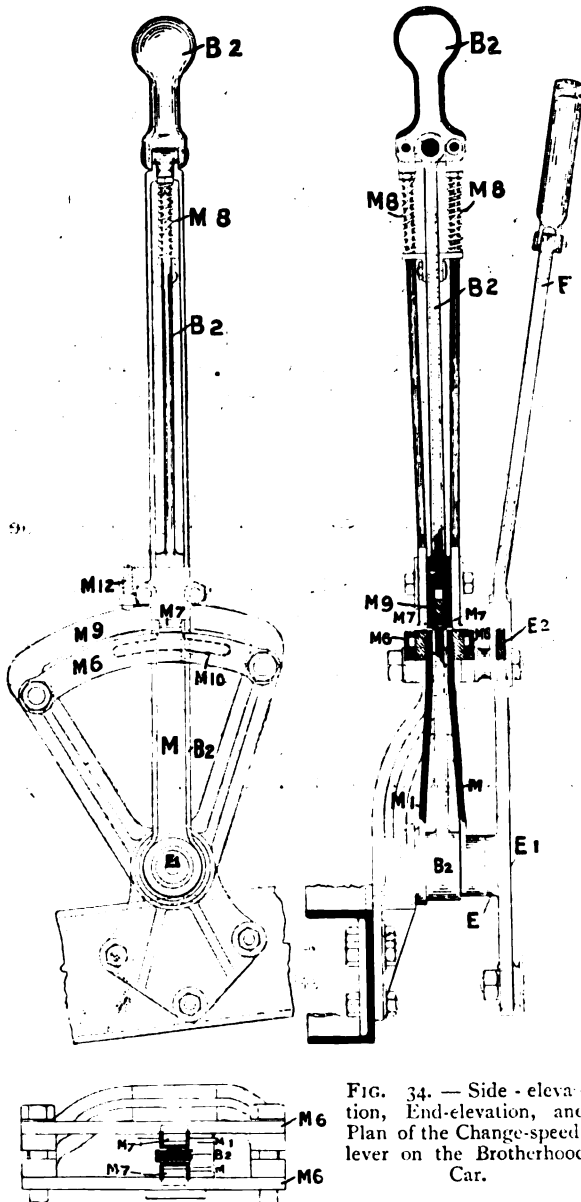


FIG. 34. — Side elevation, End-elevation, and Plan of the Change-speed-lever on the Brotherhood Car.

axle. In both cases the brake-band is composed of two steel semi-circular shoes, E^3 , that are fitted with easily

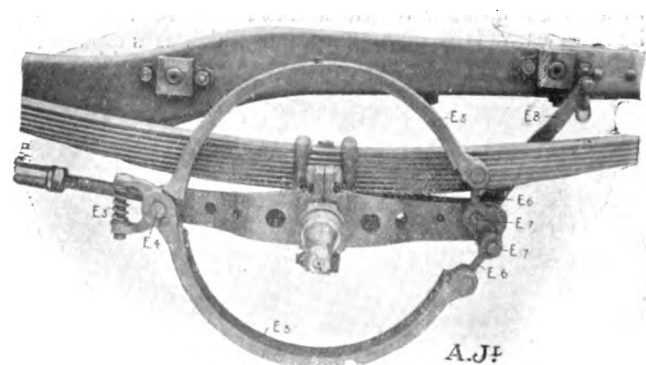


FIG. 36. — View of the rear portion of the Brotherhood Chassis, showing the manner in which the Hub-Brake is arranged, to allow of the ready removal of the Road-Wheel.

the driver—instead of being pushed forward—for this purpose.

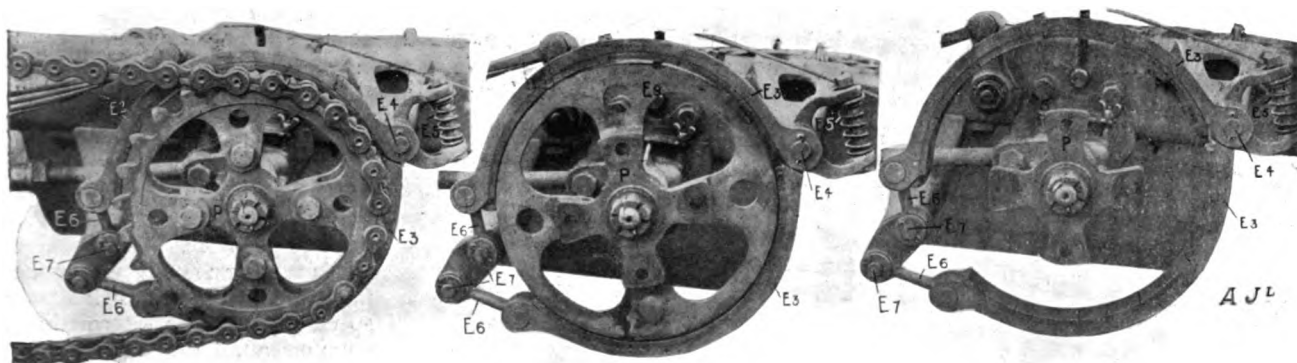


FIG. 35.—Three Views of the Countershaft Brake on the Brotherhood Car, showing—in addition to the Construction of the Brake—the method adopted for enabling the Sprocket and the Brake-Drum to be removed without disturbing the Brake-Shoes.

Conclusion.

From the foregoing description it will have been realised that the Brotherhood car has had a very great deal of careful attention bestowed upon its design, and that it is something more than a mere copy of other successful vehicles, the makers of which have already made a name for themselves as builders of automobiles. Our article has been intended chiefly to deal with the more unusual and interesting features, rather than with the car as a whole, but even where no special mention has been made of any particular portion of it, our illustrations will be found to give such further information as is likely to be required. In Figs. 30, 32, and 33 for instance, the fittings on the dashboard, and on the footboard just behind it, are clearly shown, although at the time that these photographs were taken, the mechanical lubricator—which is in practice placed to the right, on the dashboard—was not then fixed in position.

Since the method of control, by the pedal, A³, is such a characteristic feature of the Brotherhood car, it might perhaps be advisable to add, to what has already been said in this article, that the pedal is prevented from moving too freely, by a spring-washer, which is fitted about its fulcrum-pin. Another interesting provision that has been made in connection with it, consists of an adjustable stop to limit its travel, in the direction in which it moves to reduce the power of the engine. The stop is intended for use when the car is left standing with the engine running, or at such other times as it may be desired to maintain a slow speed when the engine is doing no work. In order, however, to allow the engine to be used as a partial brake—or to economise petrol—when the car is running down hill, this adjustable stop can be entirely withdrawn from action, and then the pedal, A³, can be moved into that extreme position in which the inlet-valves remain closed, although the engine still revolves.

Table of Reference Letters for the Brotherhood Car Illustrations.

A Flywheel.	D Brake and clutch-pedal.	G ³ Needle-valve for jet.	K ¹ Water inlet connection.
A ¹ Exhaust-box.	D ¹ Square clutch-shaft.	G ⁴ Sliding tube.	K ² Water outlet-connection.
A ² Petrol tank.	D ² Flange-coupling.	G ⁵ Conical sleeve around jet.	K ³ Hollow bearing for propeller.
A ³ Engine-controlling pedal.	D ³ Clutch-fork.	G ⁶ Auxiliary-air valve-sleeve.	K ⁴ Outlet port.
A ⁴ Sliding rack for variable-lift device.	D ⁴ Fulcrum-pin for fork, D ³ .	G ⁷ Cylindrical guide for sleeves, G ⁵ and G ⁶ .	L ¹ Pulley on lubricator spindle.
A ⁵ Pinions on push-rods for same.	D ⁵ Adjustable roller for fork, D ³ .	G ⁸ Air-ports in cylinder, G ⁷ .	L ² Spindle.
A ⁶ Pressure-valve for fuel feed.	D ⁶ Cam, operating clutch.	G ⁹ Atmospheric piston.	L ³ Worm on same.
A ⁷ Main petrol cock.	D ⁷ Hand brake-lever.	H ¹ High-tension ignition-plugs.	L ⁴ Crank-pins on worm-wheel shaft.
A ⁸ Hand-pump for same.	D ⁸ Rock-shaft for same.	H ² Chopper switches for same.	L ⁵ Pivoted levers operated by L ⁴ .
B Gear-box.	D ⁹ Quadrant for same.	H ³ Safety bar.	L ⁶ Pump plungers.
B ¹ Flexible couplings on counter-shaft.	D ¹⁰ Brake shoes.	H ⁴ "Timing" governor.	L ⁷ Supply port, to pumps.
B ² Change-speed-lever.	D ¹¹ Fixed fulcrum pins.	H ⁵ Commutator spindle.	L ⁸ Springs acting on plungers.
B ³ First-motion shaft.	D ¹² Disengaging springs.	H ⁶ Spiral gear-wheel on H ⁵ .	L ⁹ Feed-pipes to engine.
B ⁴ Second-motion shaft.	D ¹³ Operating links.	H ⁷ Sliding gear-wheel on H ⁶ .	M Spring-arm for 3rd and 4th speeds.
B ⁵ Differential countershaft.	D ¹⁴ Pinion to rock-shaft.	H ⁸ Vertical shaft, driving commutator.	M ² Spring-arm for 1st and 2nd speeds.
B ⁶ Guide rod for sliding forks.	D ¹⁵ Lever for hub-brake.	H ⁹ Spring for governor.	M ³ Lever-arm connected with M.
B ⁷ Rock-shaft for operating 1st and 2nd speed.	D ¹⁶ Countershaft brake-drum.	H ¹⁰ Cover for spring, H ⁹ .	M ⁴ Lever connected with B ² .
B ⁸ Hollow shaft operating 3rd and 4th speed.	D ¹⁷ Steering-gear casing.	J Commutator.	M ⁵ Lever-arm for "reverse."
B ⁹ Lever fixed to shaft, B ⁷ .	D ¹⁸ Segment.	J ¹ High-tension distributor-arm.	M ⁶ Slotted plates of lower quadrant.
B ¹⁰ Lever fixed to shaft, B ⁸ .	D ¹⁹ Casting fixed to frame.	J ² Low-tension brush.	M ⁷ Sliding wedges on lever, B ² .
B ¹¹ Sliding rod for "reverse" gear.	D ²⁰ Fixing bolts.	J ³ Conductor fixed to J ¹ .	M ⁸ Springs, controlling M ⁷ .
C Radiator.	D ²¹ Lever-arm.	J ⁴ Brass ring surrounding J ¹ .	M ⁹ Central quadrant for lever, B ² .
C ¹ Inlet pipe to radiator.	D ²² Hooter bulb.	J ⁵ High-tension distributor terminals.	M ¹⁰ Slots in quadrant plates, M ⁹ .
C ² Outlet pipe from radiator.	D ²³ Flexible tubing to hooter.	J ⁶ Ebonite bushes for same.	M ¹¹ Sleeve, for "reverse" mechanism.
C ³ Baffle plates in side headers.	D ²⁴ Air-inlet to carburettor.	J ⁷ High-tension terminal.	M ¹² Spring catch for lever, B ² .
	D ²⁵ Mixture outlets.	K Circulating pump.	P Star bosses on countershaft.
	D ²⁶ Spray jet.		



FOLLOWING the results of the recently held reliability trials in India, it is satisfactory to learn that the Indian Post Office has established a motor service for mails and passengers between Bezwada and Masulipatam. The distance, which is 40 miles, is covered in less than 2½ hours, inclusive of a number of halts. As hitherto

the postal service between the two towns has been conducted by "runners," who took 14 hours to carry the mails, and who, consequently, must have proceeded rather more slowly than most people walk, the improved effects produced by the motor car service are a distinct benefit to the community.

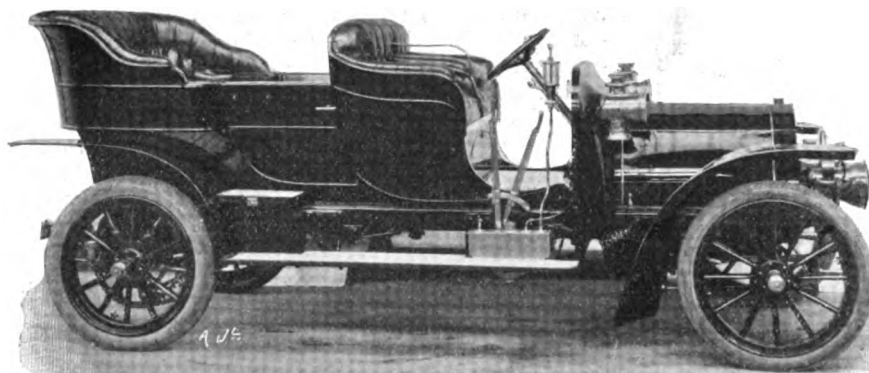
AGRICULTURAL HALL SHOW.

MESSRS. CORDINGLEY AND CO.'S annual Show at the Agricultural Hall opened on March 18th and closes to-day, Saturday. In view of the fact that this is the third London exhibition which has been held this year, and

Company showed specimens of their well-known steam vehicles.

The St. Pancras Ironworks Company show a five-ton steam wagon, fitted with a vertical fire-tube boiler which

is top fired, and a compound engine having a stroke of 6 ins. and a bore of 4 ins. and 7 ins., for the high and low pressure cylinders, respectively. The engine is placed horizontally under the frame, and drives, through a two-speed gear and an intermediate countershaft, the differential countershaft, which carries the chain-sprockets. A piston valve, fitted with rings, is used for the high-pressure cylinder, and an ordinary slide-valve for the low-pressure cylinder, while there is, of course, a valve for admitting high-pressure steam to both cylinders when necessary. One of the features of the vehicle is the suspension of the front-axle, which is carried by ordinary semi-elliptic side springs from a separate underframe, the whole forming



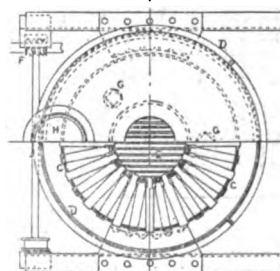
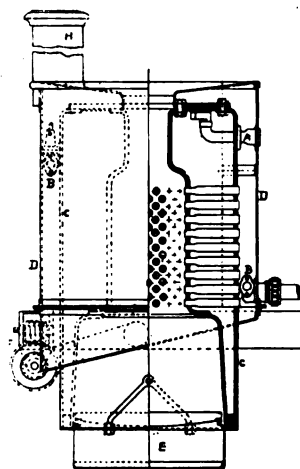
AGRICULTURAL HALL SHOW.—The 15-20-h.p. Brooke Car, that has been built for Mr. E. Estcourt. It has a wide side-entrance body, a 10-ft. wheel base, natural circulation, and many ingenious special features.

that there have also been several Provincial shows, it was, perhaps, hardly expected that it would prove to be as interesting as it is. Even if the available space is less crammed than last year, however, there is at least no apparent falling off in exhibits and, as is usual at this Show, several new cars are exhibited for the first time. The industrial vehicle section, which is one of the features of the Agricultural Hall Shows, is this year even larger than in previous years, and it is marred only by the forced absence of a few notable makers such as the Thornycroft Company, the Coulthard Company, the Straker Company, and the Milnes-Daimler Company, who are supporters of the "one exhibition only" principle, and that one the Olympia Show. Manufacturers of tyres, accessories, and motor clothing are always well represented at the Agricultural Hall, and this year is no exception to the general rule; while the aeronautical exhibits are, in themselves, a great attraction to the public.

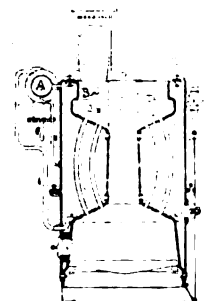
The majority of the cars exhibited have, of course, already been dealt with by us in the past, and several of those vehicles which are now exhibited for the first time have already been, or are now being, described in our columns. Notable among these are the new 35-h.p. Brooke chassis, which is described elsewhere and is shown on the London and Parisian Motor Company's stand, and the Rational car—shown by the Heatly-Gresham Engineering Company—which was illustrated and described in our issues of November 19th, &c., 1904. Nearly all the heavy commercial vehicles which are exhibited have been very fully described by us in the past, and the latest improvements have been embodied in the special articles which we are now devoting to this subject, so that it is merely necessary to mention that the Lancashire Steam Motor Company, the Seaham Harbour Works, Mann's Patent Steam Cart and Wagon Company, the Hercules Motor Wagon Company, the Yorkshire Patent Steam Wagon Company, Savage Brothers, and the Bristol Wagon and Carriage Works

ing a bogie-carriage, which is pivoted, so that either end of the axle can be raised without throwing a twisting stress on the main frame.

The "London" 6-ton steam wagon, shown by J. Stewart and Son, is also fitted with a vertical fire-tube boiler, and has a compound engine having a 7-in. stroke, with a 4-in. and 7-in. bore, for the high and low pressure cylinders, respectively. The engine lies horizontally under the main frame, and drives the differential counter-



The Agricultural Hall Show.—Elevation and plan (half-sectional) of the Fire-Tube Boiler employed on the Robertson Steam Wagons, of which we gave a description last week.



The Agricultural Hall Show.—The "Ellis-Balmforth" boiler for steam luries, which has curved fire-tubes to facilitate expansion and contraction.

shaft through a pair of spur-wheels. The rear wheels are driven by side chains, and two speeds are provided, by sliding spur-wheels, in the usual way. A spring drive—having a number of helical compression springs—is arranged in the rear wheels to reduce sudden shocks, and a device for locking the differential gear is also provided for use in case of emergency.

The 5-ton wagon staged by Jesse Ellis and Co. is fitted with a loco-type boiler which is top fired, and has drop fire-bars. The compound engine—having cylinders of 4 ins. and 8 ins. bore with a stroke of 6 ins.—lies horizontally under the frame, and the live-rear-axle is driven by spur-gearing. The engine is carried rigidly from the frame, which is on a three point suspension, and the back axle—which runs on roller bearings—is kept in alignment by an ingenious inter-connection between the axle and the frame. This device consists of a transverse-shaft, riding in bearings secured to the main-frame, the shaft having a horizontal lever-arm on both ends, and vertical hinged links to connect the two ends of the axle to the respective lever-arms. Any tendency for one wheel to rise or fall is, therefore, at once transmitted, through the transverse-shaft, to the other end of the axle, which, in consequence, always tends to keep parallel with the transverse member of the main-frame. The makers find that this device—by ensuring alignment between the axle and the countershaft—relieves the gear-wheels of the jamming action which results if the driving and driven-shafts do not always remain parallel, and enables the axle to be satisfactorily gear-driven.

The exhibits of the Thames Engineering Works include a 4-ton steam lurry, and a 25 cwt. delivery van fitted with a 12-h.p. twin-cylinder petrol engine. The lurry has a compound engine arranged horizontally beneath the frame, the high and low pressure cylinders having a bore of $3\frac{1}{2}$ ins. and 6 ins. respectively, with a stroke of 6 ins. A live axle is employed, and the drive is transmitted to it through a propeller-shaft. Two speeds are available by the usual arrangement of sliding



AGRICULTURAL HALL SHOW.—Petrol Motor Delivery Van constructed by Jackson and Co. This car is of the live-axle type, is fitted with a De Dion type of engine, and has a gear-box of the sliding spur-wheel type, giving three forward speeds and a "reverse."

spur-wheels, and these give normal speeds of $3\frac{1}{2}$ and $6\frac{1}{2}$ m.p.h. The boiler is of the locomotive type and is side-fired. Large torque- and radius-rods are employed to relieve the rear springs of any driving strain, and the front ends of the front springs are hinged to a transverse rocking beam which is pivoted at its centre to the main-frame.

Besides the heavy steam luries, there are also a few makers who exhibit petrol-driven industrial vehicles. The N.A.G. show a 12-14-h.p. 3-ton lurry fitted with a 2-cylinder engine. The mechanically-operated valves are on opposite sides, and low-tension igniters are fitted in the inlet-valve chambers. The road wheels are driven by side chains, and the change-speed-gear is of the Mercedes type, but is operated by a lever which is mounted on the steering-column. Pickering and Co. also show a 2-ton petrol lurry, and the Motor Car Emporium show a $1\frac{1}{2}$ -ton petrol delivery van.

The Hunslet Engine Company show an interesting petrol lurry which is fitted with a gradually variable speed-gear of the Hagen type. The engine drives, through bevel-gearing, a transverse countershaft which carries variable eccentrics, and the eccentric rods are used to operate a gear on the back axle. Their reciprocating motion is imparted to free-wheel clutches, which engage with clutch-drums on the axle; the clutch can be made to operate either in the "forward" or in the "reverse" direction, and the gear ratio is changed by altering the throw of the eccentrics on the countershaft, this operation being performed, as required, by the engine. Another petrol lurry fitted with a gradually variable speed gear is the "Frick," which is shown by Dougill's Engineering Company. It



AGRICULTURAL HALL SHOW.—The 5-ton Savage Steam Luries are fitted with water-tube boilers, and the rear wheels—which have pressed steel centres and wrought iron rims—are driven by side chains.

differs considerably from that just referred to, and was illustrated and described in our last issue.

Comparatively few public service vehicles are exhibited, but the Lancashire Steam Motor Company show their new Crossley-Leyland petrol 'bus, which was referred to in our last issue, and is illustrated and described elsewhere. The Motor Car Emporium also show a single-deck omnibus, as well as a double-decker. Both are fitted with 30-h.p. engines, and the latter is specially constructed so that the engine can be used as a brake. The regulating lever above the steering wheel is interconnected, for this purpose, with the exhaust-valve cam-shaft, which can be set so as to open the exhaust-valves at the end of the compression stroke. Normally this lever operates on the throttle, but when used as a brake it cuts off the petrol supply and rocks over the exhaust-valve cam-shaft so that the air which is drawn into the cylinders on the suction stroke and compressed, is exhausted just as the piston comes to the end of its upward stroke. The compressed air being thus released as soon as it is compressed, is unable to do work in the engine, as it would if allowed to expand in the cylinders during the subsequent downward stroke of the piston. Another public service vehicle is the char-a-banc shown by Durham, Churchill and Co. This vehicle has a seating capacity for twenty passengers, and is driven by a 24-h.p. 4-cylinder Aster engine. The engine is fitted with a metal to metal cone-clutch, and there is a gear-box of the sliding spur-wheel type which provides three forward speeds and a reverse. The power is transmitted through a very long propeller-shaft to a transverse-shaft which drives the road-wheels through spur-gearing. The road-wheels are fitted with internally-toothed gear-wheels, and the differential countershaft is carried by the long angle-iron radius rods which tie the rear axle to the frame.

In connection with heavy vehicles, the road-wheels form one of the most vital parts. Much attention has, in consequence, been devoted to their successful construc-

tion. Several firms employ cast steel wheels, and one or two have wheels made up with a pressed steel centre and a wrought iron rim. Some attempt has been made to use all wood wheels, but the happy medium appears to exist in the composite wheel, which has a steel rim with wood interposed between the rim and the hub. Among this type are the wheels fitted to the Hercules steam wagon—a description of which appears elsewhere—and a new form of wheel, built and designed by Stagg and Robson, in which wooden spokes are employed in conjunction with cast steel hubs and rims. The wheels on the Leyland vehicles are somewhat similar to those used on the Hercules wagon, but they differ in that the wood felloe is allowed to overlap the flange on the steel centre. In the Hercules wheel, it will be noticed, the wood is entirely supported over its inner face, so that the flange on the cast steel centre is unable to produce any cutting effect upon it. In comparing composite wheels with wood felloes and wood spokes, it must, of course, be remembered that they serve two different purposes, for whereas the wood felloe affords a certain amount of cushion to the "load," it is unable to give that springiness to the "drive" which is the principal feature of the wood spoke wheel.

(To be continued.)

AWARDS for novelty of design or special features, made by the Judges' Committee of the Motor Van and Wagon Users' Association:—

- William Foster and Co.—Convenient arrangement of foot plate.
- Gare Patent Tyre and Wheel Company.—Design of resilient wheel.
- R. Garrett and Sons, Ltd.—Novelty of transmission and control.
- E. S. Hindley and Sons.—Accessibility of boiler.
- Hunslet Engine Company, Ltd.—Self-adjusting protection plates for wooden tyres.
- Motor Car Emporium, Ltd.—Design of omnibus body.
- J. Robertson and Sons.—Design of back axle and system of locking glands by protecting clips.
- Stagg and Robson, Ltd.—Design of wheel.



Motor Van and Wagon Users' Association.—On Tuesday, a luncheon took place at the Hotel Cecil, to commemorate the issue of the Heavy Motor Car Order. About sixty guests were present. Col. R. E. B. Crompton, C.B., the Chairman of the Association, presided, and amongst those who were present were:—Sir W. H. Preece, K.C.B., Col. Holden, R.A., Sir Albert K. Rollit, M.P., Mr. Henry Norman, M.P., Mr. J. C. Inglis (General Manager of the Great Western Railway), Mr. Sidney Straker (Chairman of the Society of Motor Manufacturers and Traders), Mr. T. Thornycroft Vernon (Chairman, Self-Propelled Association), Messrs. W. Worby Beaumont, E. H. Cozens-Hardy, E. M. C. Instone, T. Staplee Firth, T. Clarkson, C. Aldington (G.W.R.), F. C. A. Coventry (G.W.R.), Charles Jarrott, Frederic Coleman, W. M. Letts, Jesse Ellis, Howard Humphreys, F. Thompson Lyon, W. H. Willcox, J. W. Stainer, E. Shrapnell Smith, Stanley Spooner, E. Dangerfield, and the hon. secretary, Mr. Rees Jeffreys.

After due honour had been accorded to the loyal toasts, "Success to Commercial Automobility" was proposed by Sir William Preece, who drew attention to the fact that there were 26,000 motor cars and 25,000 motor cycles registered in London—a fact, he thought, which would give a greater impression of the growth of the industry than anything he could say. Of these, 3,500 were registered for commercial purposes. He was certain that through automobility we were on the brink of a vast future. Automobility would bring about (1) rapid despatch, (2) frequent service, (3) cheap fares, and with these London would become a paradise. He mentioned that a Standardisation Committee of engineers for all kinds of motor cars was about to commence sitting within a few days, and he felt sure that, as a result of their deliberations, another step would have been gained in helping forward the industry.

Colonel Crompton, in responding to the toast, looked forward to the industrial motor vehicle revolutionising the entire commercial side of this country. Their Association was young, he said, but healthy, and all they required was a rapid growth of membership

to ensure a huge success in the near future. By all the users and manufacturers combining with the Association they would be able to work together to their mutual good, and by means of concerted action obtain privileges which they would have to fight for against the innate conservatism which, he feared, would exist for many years to come against the introduction of the mechanical commercial vehicle. Amongst the Association's chief duties would be to get legislation for a 20th century administration of its highways and take action against the wholesale scheduling of bridges as being incapable of carrying anything. Action of this character on the part of the local authorities was all directed against the development of mechanical traction and must, therefore, be fought and overcome. He had for the past few months been obtaining statistics in regard to the passage of traffic through our streets and had amassed a vast amount of very valuable information. From this he was convinced that by means of motors it would be easily possible to accommodate two and a half times as much traffic in the streets of London as at present it was possible to move. By means of motors the congestion would disappear and the aspect of the London traffic would be entirely changed. Mr. Worby Beaumont, in proposing the toast of "The Guests," emphasised strongly the fact that the automobile problem was, as he had always maintained, mainly a road problem.

Sir Albert Rollit, who responded for the guests, said that the feature of the past and the present century was mobility. The horse, he thought, before long would be extinct, except in sport, and mechanically in the indication of horse-power. The only rival to the motor, he thought, was the telephone, which, speaking as a director of the National Telephone Company, he was convinced would do away with the necessity of mobility. In regard to the development of heavy traffic he thought the light brigade cars had done splendid yeoman's work in clearing the way, and now the heavy brigade vans were coming rapidly into prominence, and would do a great deal to promote general prosperity for the whole community in the near future.

"NON-SLIPPING TREADS AND OTHER NON-SLIPPING DEVICES FOR MOTOR CARS."*—By Mr. J. D. Siddeley.

I SHOULD explain that this is not a paper. My idea to-night is simply to open a discussion on the question of non-slipping devices. I should just like at the outset to make one remark in relation to side-slip. Side-slip on a motor car fitted with pneumatic tyres is much less dangerous than side-slip on a motor car when it is fitted with solid tyres. A most peculiar circumstance in connection with non-slipping tyres is due to the fact that certain forms of grooves in covers do in a degree mitigate side-slip. I cannot give you any real reason why this is so, but you can take it as a fact that in a degree it is so.

Concerning these different devices, the chief and most important to the user is the question of wear. If I were asked to say which non-slipper was the best for all purposes, I should say the easily detachable metal non-slipping device. There are several ways of attaching leather covers. Some people take the leather right down the side of the cover and wrap it over the edge of the bead. At first sight that sounds a good thing, but actually, I should not care to recommend it unless that leather were reduced to such a thin skin as to be almost too expensive as a commercial commodity. Such construction causes the beads to come closer together in the centre of the rim, and therefore to reduce the normal space between the beads and the cover, thus tending to cause pinching inside.

I am glad to see a further development on the part of the big makers of non-slipping leather covers, in that they have made arrangements with important tyre companies, whereby houses supply them with the casing—the casing, you know, is the main part of the tyre. Over and above that there is the tread—the shoe. That, you see, is an addition to the casing, and if, instead of having a shoe, you have a leather cover, you have a more flexible complete cover, and consequently the thing will wear better. I may say it has come to my knowledge to-day that a 90-h p. Mercedes is running at the present time in Paris fitted with one of this type of cover—I believe the Samson. If I were asked to give the life of a leather cover I should say about 2,000 miles, and I have heard of tyres being re-treaded after that period.

THE DISCUSSION.—Mr. W. Worby Beaumont in the chair.

Mr. O'Gorman.—With regard to the L'Empereur device at the French Non-skid Trials last year, that particular device came out for the first time, and he had had an opportunity of examining the tyres of a car, which had been 600 miles, fitted with L'Empereur skids, and the tyres were absolutely unworn. He knew what the drawbacks were, and perhaps he ought to summarise them. That device did undoubtedly stretch, which was a very important thing against it. It flapped about, and in the event of a puncture would perhaps slip off and get into one's chains. He did not, however, think that that trouble was very seriously to be apprehended, as they were intended to be fitted reasonably tight. Two important matters in connection with non-skidding generally, were the design

of the car and the position of the main weight, that was, whether or not it was in the centre of the direction of the line of motion.

Mr. Chambers mentioned that his firm's experience with the Samson, the Grosse, and other kinds of leather non-slipping devices which were vulcanised on to the tyre, had been very successful. They had made extensive experiments with the Parsons chain, the Wilkinson, and other devices, and with the Parsons chain they found a difficulty in connection with town carriages which would not occur with country cars. The driver of a town carriage had to pull up to the kerb, and anything that projected beyond the sides of the tyre came in contact with the kerb, which cut them to pieces.

Mr. Henry Edmunds said when he applied the Parsons chains he found, to his intense satisfaction, that he could go out in all weathers without the slightest fear. Mr. Parsons had made an interesting claim that his chains must be free to creep on the wheel. If they were too tightly bound on to the wheels there was a tendency to cut the rubber. Recently some very interesting experiments had been made, in which a leather band was free to creep, and one did not get the wear that occurred with a device that was not free to travel.

Mr. Bourke.—With regard to L'Empereur device, after running 1,000 miles the big plates began to crack, and after another 100 miles or so the small links at the side began to break. They had evidently become brittle. He took them out and annealed them, and they never came off again. The big flat plates were completely worn out in about 1,200 miles, and the cost worked out at somewhat more than 1½d. a mile, which was very excessive.

Mr. Austin said that, living in Birmingham, he was greatly astonished at the manner in which omnibuses weighing something like 5½ tons could run on the greasiest of wood blocks without any danger of slipping by the use of twin tyres. He would suggest that perhaps the use of small twin solid tyres for pleasure vehicles might get over the difficulty better than the use of any chain or other device.

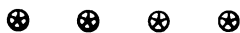
Mr. Lyon Sampson stated that he was inclined to think that a great deal of the immunity from slipping with 'buses came from the fact that the driving wheels were heavily laden, whilst with pleasure cars it was generally the other way.

Mr. Hugh Lewis said that on his own car he had fitted Palmer tyres on the back wheel, and he was convinced that the tendency to side-slip was very greatly diminished thereby.

Colonel Ferguson said that he had also had some experience with the Palmer tyre, and he had had no trouble at all with side-slip.

Mr. W. W. Beaumont (the chairman), said that there was one point to which he would like to refer, viz., the effect of using one anti-skid only, which threw a very heavy stress upon the wheel so fitted. He had made a little calculation to show what that stress was, and found that if a car weighing 1 ton skidded at only about five miles an hour and were brought to rest, with regard to the side-slipping movement, in, say, 3 ins., a side stress upon the one wheel that had to do the stopping was slightly over 1½ tons.

* Extract of a discussion which took place at the A.C.G.B.I. on Thursday, March 9th.



REVIEWS OF BOOKS.

The Harmsworth Encyclopædia.

In 40 Fortnightly Parts,
Price 7d. each.

(London: The Amalgamated Press, Limited, and
Nelson and Co.)

THIS is a most determined and praiseworthy attempt to provide popular information at a very cheap rate, the wonderfully well illustrated parts being published at the extremely moderate price of 7d. each. The present part deals with the alphabet up to as far as the word "Algiers," and contains succinct and readable little articles on an almost inconceivable diversity of subjects. Thus we have an epitomised history of ancient Alexandria, whose celebrated lighthouse, by the way, has provided the French name for the modern automobile headlight, and even little-known poets like Alcman are mentioned. The hot-air engine is well described, and admirably illustrated, and if the petrol engine and the

motor car are dealt with in the same effective manner, the volume in which they appear should command a ready sale amongst automobilists. Of direct interest to automobilists in the present volume is the article on accumulators, a subject which is treated with great comprehensiveness for the small space allotted to it, and also that on acetylene, in which several types of generators for headlights are shown. Its up-to-dateness is apparent in illustrations of a mechanical agricultural motor engaged in ploughing and reaping, which accompany the article on agriculture.

"Motoring Annual and Motorists' Year Book, 1905."

5s. net. (London: Motoring Illustrated.)

THIS year's volume of this useful book (the third which has been issued) forms a concise work of reference which should prove of great value to everyone interested

in the motor car movement. It provides, in a concise form, a record of the principal automobile events of the past year, while considerable additions have been made to all the numerous sections which the work comprises. The largest and most generally interesting of these is formed by a Motorists' Who's Who, beginning with the King, Queen, and the Royal Family, and ordinary automobilists following in alphabetical order; and this section is followed by a list of all the automobile clubs and other institutions devoted to automobilism, both in this country and abroad. Particulars are also given of the motor 'bus services at present running in Great Britain, while there is a good deal of information both on tyres and the principal types of car and present manufacturers. A useful feature is provided by the tables of metric equivalents given.



CORRESPONDENCE.

* * *The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.*

MUTUAL INSURANCE ASSOCIATIONS v. PROPRIETARY INSURANCE COMPANIES.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I have been interested to read the letters which have appeared in various issues of your paper from Mr. A. J. Wilson, advocating mutual insurance in principle; and from Messrs. J. and R. Bovey, calling attention to the advantage of their own particular mutual insurance scheme.

With regard to the former, everybody must agree that mutual insurance in principle is an ideal method, because not only is insurance reduced to its minimum cost, but the interests of all members of a mutual association should be so identical that each member will not only be anxious to reduce any claim he may have to make to a minimum, but each member will see that every other member is equally zealous, faithful, and unselfish.

The above, in theory, is beyond dispute, but human nature, being what it is, is, unfortunately, found in practice that the experience of some 250 years of endeavour to put into operation the logical principle of mutual insurance gives a verdict of absolute failure. Mutual insurance does not, however, fail because of inherent defect, and no one believes in it more in principle than I do, but in practice there is no doubt that it does fail, and fails badly, and probably for, amongst others, the following reasons, namely:—(a) that the interests of a mutual scheme, being everybody's interests, are nobody's interests; (b) that some member, or official, or promoter of a mutual scheme, having a very definite axe to grind, imposes too great a burden; (c) bad management; (d) dissensions amongst the committee of management; (e) parsimony in the payment of the official or officials controlling the mutual scheme, with the result that you often find the men who have proved failures in the employ of proprietary insurance companies at the head of mutual insurance schemes; (f) through the non-payment of commission, restricting the area of operations, and the ability to make up for the waste and the lapses which must inevitably occur through changes in business, deaths, and effluxion of time; (g) ignorance of insurance principles, and which alone will enable either a mutual or a proprietary insurance venture to succeed; (h) lack of experience in dealing with the claims which will arise, and in motor car insurance ignorance of settling claims whether for damage to the cars or for personal injuries sustained by third parties is simply and hopelessly fatal.

As an object-lesson, I may mention that in 1898, when the Workmen's Compensation Acts came into force, some hundreds of mutual schemes were started, but in less than seven years nearly the whole of them have either gone out of existence or else been grafted upon proprietary insurance companies.

Personally, I should have thought that, if there were any hazards which might be left to the insurance companies to buy experience in respect of, it would have been those in connection with motor cars, as I understand, if you ask the majority of the accident insurance companies doing motor car business, you will find they have made a loss, and, in some cases, a serious loss, through undertaking this particular class of business.

PUBLICATIONS RECEIVED.

Vacuum Mobilis. The Vacuum Oil Company, Limited, Norfolk Street, Strand.

How to Take Out Patents in England and Abroad. By E. and A. F. Edwards. London: Wyman and Sons, Limited, Fetter Lane. 2s.

The Harmsworth Encyclopedia, in 8 vols. London: The Amalgamated Press, Limited, and Thomas Nelson and Sons. 40 fortnightly parts, price 7d.

Automobile-Kalendar, 1905–1906. Berlin: M. Krayn. Price M3.

Catalogues.

S. Smith and Sons' Speed Indicators. 9, Strand, W.C.

Electrical Ignition Appliances, 1905. Coventry: Van Raden and Co., Limited.

Renold Patent Silent Chain and Wheels, 1905. Manchester: Hans Renold, Limited.

Richard-Brasier Motor Cars, January, 1905. London: Mann and Overtons, Limited, 7A, Lower Belgrave Street, S.W.

Since, however, I, as the pioneer, started the business in 1898, such has not been my experience, but I must say that *certain sections of the business have never proved profitable, and do not do so at the present time*, and, therefore, as the rates of premiums for such sections are being very definitely raised, I should imagine that any mutual scheme formed at the present time would be very largely supported by those whose insurances had proved unprofitable to proprietary insurance companies; in fact, the likelihood is that the comparatively few desirable hazards would have to bear the burden of supporting the claims which will arise under the many undesirable risks.

Yours faithfully,

FREDERICK THORESBY, General Manager,
Car and General Insurance Corporation, Ltd.
1, Queen Victoria Street, March 17th.

DELHI-BOMBAY TRIALS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Mr. Huntley Walker states in his letter that one of the judges has asked him to publish the judges' report, which was suppressed by the Indian Union. Were it not for the fact that all of us who took part in the Delhi-Bombay Reliability Trials saw what vague and differing opinions each official of the Indian Union and the judges had as to why the 30 cars started from Delhi to run 900 miles, and what the prizes were to be given for, I should feel inclined to think that Mr. Huntley Walker had mistaken what the judges said, for the report, if possible, adds to the muddle. It shows, firstly, that although advertised as a reliability trial, there was, in reality, no prize for "reliability" open to large cars competing, as, according to the rules, the Lyons Cup, which was given as first prize for reliability, had to be given to a car costing less than £500. Secondly, the Gaekwar Cup was not given as a reliability prize, but because it was the car the judges fancied to be best suited for India. Thirdly, the *Times of India* Cup (which was called in the rules a "consolation prize") was given, as second prize, to a car that had done a non-stop run, and had obtained full marks, and was, of course, promptly returned with thanks by the recipients.

All the rules and notices issued by the Union from time to time had given everyone—except the judges—clearly to understand that the Gaekwar Cup was the principal prize, and that it was to be given to the most reliable car, according to the marks obtained. Therefore, why judges were ever appointed, why they turned the prizes topsy-turvy, and why they considered a car that had lost 58 marks, through having to stop over an hour on the road on account of mechanical, water, and other troubles, was the car most suited to India is, and apparently will, remain a mystery.

Everyone who took part in the run agreed that as a picnic it was a success, and the arrangements perfect, but that as an official trial it proved a complete fiasco.

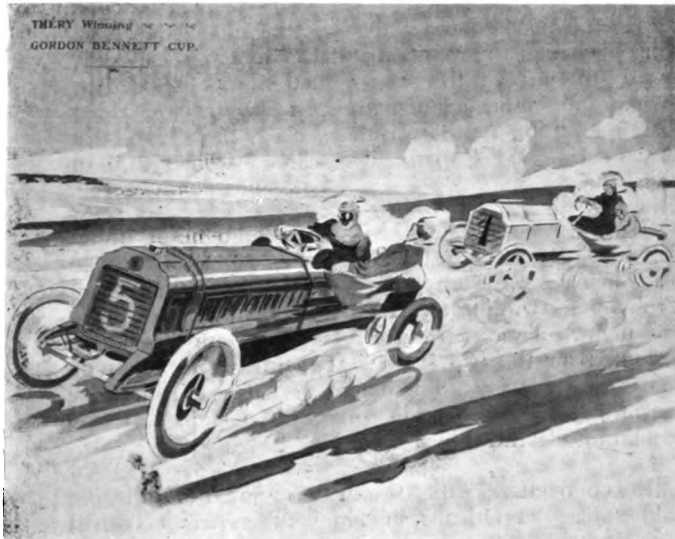
It is, however, very encouraging to those who are interested in the progress of the British industry to see that the trial clearly demonstrated that British cars are superior for use in India to the foreign-made cars, as, according to the official reliability marks awarded, there were seven British cars amongst the first eleven most reliable. The foreign car to which the much-discussed cup was awarded came twelfth, fourteen foreign cars scratched or were unable to finish, and a British car did the best average time from Delhi to Bombay.

Yours truly,

March 16th.

B. JOHNSON.

RACES, RECORDS, AND TRIALS.



A reduced photograph of the clever coloured cover of Messrs. Mann and Overton's latest Catalogue. The picture, which in the original is full of life, depicts Théry winning the Gordon-Bennett Cup last year on a Richard-Brasier Car.

Gordon-Bennett Race.—The French Selection Trials.—Already 17 cars have been entered officially to take part in the eliminating trials, the entries for which close on Friday next, March 31st. Several more entries are expected, and although it has been widely stated that the De Dietrich house will not be represented this year, we learn, upon indisputable authority, that cars to take part in the eliminating trials are being manufactured at the present moment in the Lunéville factory, and these will be driven by Messrs. Gabriel, Duray, and Rougier. The new official entries since our record last week are: 3 Darracqs and 3 Renault cars.

The starting point for the race has not yet been determined upon, as *pourparlers* between the French and other clubs are going forward in connection with the distance over which the race is to be run. It may either be 550 or 525 kilometres. If the former, the circuit already selected will be added to by 22 kilometres between Pontgibaud and La Baraque, the start taking place from Pontgibaud. If the lesser distance is determined upon, the start and finish would probably be at the Terres de Laschamps, at the foot of the Puy de Dôme. The Swiss and Italian clubs have already agreed to the lesser distance.

In all probability arrangements will be made whereby the King of Spain, who, it is expected, will be on a visit to France at the time, will be able to witness the racing.

THE Isle of Man House of Keys, on Tuesday, passed the Bill to enable the British Selection Trials for the Gordon-Bennett Race to be held in the island on May 23rd, and also for the Tourist Trophy competition to take place in September. For the latter, the latest entries are a Clement car by Mr. E. H. Lancaster, a Standard car by Mr. R. W. Maudslay, a Gladiator by Mr. A. McCormack, and a Renault by Mr. A. R. Atkey.

Scottish Reliability Trial.—The entries for this trial, promoted by the Scottish Automobile Club, Western Section, are already sufficient in number to ensure a big success for the competition. The numbers are ahead of those at the same date last year or in any of the previous years. Manufacturers desirous of being represented at this important trial should lose no time, as entries must be lodged with the secretary not later than April 5th next.

Coupe de Caters.—The final rules for this competition have now been issued. The main points governing the race were published by us some time ago. In a few respects these have been modified. The race is international, and will be run in teams, entries having to be made through recognised automobile clubs, the organisation being in the hands of *L'Auto*. Clubs wishing to take part in the race must notify their intention before January 1st each year, except for this year, when May 1st is the date fixed. Each nation's club will be represented



The much-discussed Gaekwar of Baroda's Cup, which was awarded to the De Dietrich Car in the Delhi-Bombay Trials for the most reliable car, we are now able to reproduce above, by the courtesy of Messrs. Charles Jarrott and Letts, Limited, who represent the De Dietrich house in Great Britain.

according to the magnitude of their country's production of automobiles. For 1905 each firm may only enter two vehicles, the proportion in future years to be revised annually. The Cup is to be run for between July 1st and October 31st annually if possible, the date being fixed before January 1st each year. For 1905 the date will be fixed before July 1st. Four-seated tourist vehicles alone are eligible to take part, and the carriage portion of each vehicle must be identical in type, although the actual lines of the carriage may, of course, vary according to the taste of the designer. The chassis of each vehicle must not weigh less than 1,000 kilogs., and the carriage portion not less than 200 kilogs., whilst the cylinder capacity must range between 5 and $4\frac{1}{2}$ litres. Vehicles must be made in every particular in the country of the clubs which they represent. Each national team will be classed according to the total average time of the team in covering the course. Cars not finishing the course will be allotted a time amounting to one hour more than the last of all the cars not classed. The race will be in one stage over a minimum distance of 500 kiloms. The entry fee is 500 francs per vehicle, which, after payment of organisation expenses, will be distributed amongst the first three as follows:—1st, 50 per cent.; 2nd, 30 per cent.; 3rd, 20 per cent.

Chateau-Thierry and Gaillon Hill Climbs.—These annual hill climbs have been practically officially sanctioned for the current year, the former taking place on October 1st, and the latter on October 15th.

Voiturette Trials.—Last week we gave the outline of the new competition being organised by *L'Auto* for voiturettes. The definite rules are now to hand, which have been drawn up after a lengthy discussion at a meeting of manufacturers. It has been decided that the minimum weight of the chassis must be 350 kilogs., and

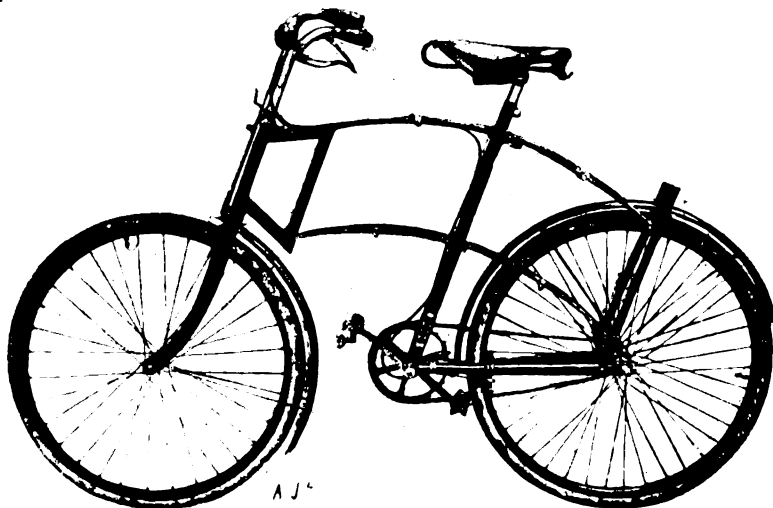
the maximum 500 kilogs., the weight of the carriage portion to be not less than 50 kilogs. The maximum cylinder capacity is to be 1 litre instead of 2 litres, as originally proposed, and in the speed test over a distance of 250 to 300 kilometres, it has been decided that the carriage portion of the car must not be changed. As a consequence of the reduction of the cylinder capacity, in view of the fact that the reduction was opposed by several important manufacturers, it has been decided that, in addition to the voiturette class, there is to be a special class and Cup for light cars of from 15-h.p. to 20-h.p.

Electric Vehicle Contest.—This competition, under the auspices of the A.C. de France, which is to take place in August, will be run between Paris, Evreux and Trouville in two journeys, recharging taking place during the night. The awards will be made on the time occupied for the two stages. The idea is not so much to organise a race as to demonstrate that the fashionable seaside resorts are within practical distance of the capital for electric vehicles.

In connection with the International Exhibition taking place at Orleans, in France, this year, a Tourist Car Endurance Run is being organised by the executive of the Exhibition, to take place from May 14 to 22, the winner to receive a special trophy termed the "Coupe du Loiret." The run will consist of 8 days journeys over a total distance of 1,892 kilometres, a special class being provided for motor bicycles, which will be required to travel 1,129 kilometres in 5 days. The cars will be classed in categories according to cost, the price in each class having to include all accessories, tools, &c. The results will be arrived at by the allotment of maximum points, with deductions for failure or inferiority in any particulars short of the highest grade.

MOTOR CYCLING.

A Spring-frame Bicycle.—An ingenious and very effective construction of a spring-frame for bicycles is that brought out by Mr. J. D. Roots, M.I.M.E., and illustrated below. The saddle pillar is carried by two pairs of inverted semi-elliptic leaf springs,



The Roots Spring-frame Bicycle.

which, owing to their length, can be of substantial construction and at the same time very flexible. The bracket carrying the chain-

wheel is, it will be noticed, supported by a hinged link in order to allow for the relative motion between the members of the frame. It is intended to adapt the principle to motor bicycle construction now that the experimental "push" bicycle has proved successful.

International Cup.—Sir Arthur Conan Doyle has entered a "Roc" motor cycle for this race.

Mr. C. JARROTT is universally appreciated for his genuine love of sport, and, in spite of his multitudinous pre-occupations, still retains his interest in motor cycling, perhaps because it was, as our readers will remember, in this particular line that he first came prominently before the automobile world. Mr. Jarrott now informs us that he has just entered a machine for the selection trials for the International Cup for motor bicycles, and hopes that, if successful in the trial, it subsequently will make a better show for England in the race itself than was the case last year. The machine Mr. Jarrott has entered is a J.A.P., and he thinks it is the most powerful that is being built in this country to compete in the race. As rider he has secured Mr. Hodgkinson, who has the reputation of being a good rider, and had the experience of running in the race last year. Mr. Jarrott has no commercial interests to serve in the matter, and is merely impelled by his love of sport and a desire to see the reputation of England worthily upheld in this particular branch, motor cycle manufacturers in this country generally having manifested but slight practical interest in the race.

CLUBS AND ASSOCIATIONS.



Above, we reproduce two views of the Derby Automobile Club Challenge Cup, and also pictures of both sides of the Club medal. The Cup is of very fine workmanship, and was executed by the Guild of Handicraft. The model was designed by Mr. B. H. Smale, the dies being prepared by Messrs. Elkington and Co.

Eastern Counties A.C.—The members of the club were fortunate in being able last week to listen to the very interesting lecture of the Hon. C. S. Rolls on "The History and Development of the Motor Car," a lecture which Mr. Rolls has already given with considerable effect recently before other associations, including the Cambridge University Engineering Society the previous week. A large number of members and friends foregathered for the occasion, the chair being occupied by Mr. F. L. Bland, the honorary treasurer of the club.

Lincolnshire A.C.—The committee of the Lincolnshire Automobile Club have already commenced to arrange their programme for the coming season. They held a meeting at headquarters on the 14th inst., and amongst those present were Sir Hickman Bacon (in the chair), Capt. Newsum, Mr. C. W. Pennell, J.P., Mr. W. R. Pennell, Mr. A. A. Padley, Dr. G. Lowe, Mr. C. Nelson, Mr. W. A. Tomlinson, and the hon. sec., Dr. E. H. Cragg. Major J. A. Cole was re-elected chairman of the administrative committee. The desirability of holding a 100 miles non-stop run for club members was considered, and, subject to the arrangement of details, it was decided to hold this on the 17th of June. It is proposed to inaugurate the season with a dinner at Sleaford, on April 29th, and there will be a hill-climb at Market Rasen—on the invitation of Mr. A. A. Padley—during the first week in June. Dr. Gilpin's invitation for a club meet in Grimsthorpe Park (by permission of the Earl of Ancaster) was fixed for the second week in July, and there will also be a gathering at Grimsby, on the suggestion of the mayor, sometime about the end of May. A week-end run to Hunstanton, and meets with the Nottinghamshire A.C., Wolverhampton A.C., and the annual run to Buxton, are also under consideration.

Motor Volunteer Corps.—A staff ride was conducted by Major-General Grant, commanding 5th Division, from the 14th to 16th inst., at Canterbury, and was attended by Lieutenant F. W. Leith on the 14th, and Captain A. Booth Hearn on the 15th and 16th inst.

Mr. W. H. George attended a staff ride, which was held in the vicinity of Midhurst, under Brigadier-General Pilcher, C.B., commanding 3rd Brigade, Aldershot, from the 15th to 17th inst.

The following officers of the corps were presented at His Majesty's Levée on the 16th inst. by Lieutenant-Colonel Mark Mayhew commanding—Captains H. H. Paynter and L. E. Scarth, Lieutenants P. V. Morgan, O. J. Llewellyn, F. W. Leith, and J. W. Orde.

Mr. G. C. Sherrin was present at a staff ride, held by Major-General Wynne at Colchester, on the 16th and 17th March.

THE Society of Motor Manufacturers and Traders now comprises 167 firms, representing the motor vehicle and motor boat industry. On February 22nd special resolutions altering the Articles of Association of the Society were registered at Somerset House, whereby applicants, on being duly proposed by a member, can be entered on the register without the formality of election. Under this change of rule the following names have already been added, whilst we understand numerous further applications are being received almost daily:—The Anglo-American Oil Co., Ltd.; the Adams Manufacturing Co.; Brown Bros., Ltd.; J. W. Brooke and Co., Ltd.; British Automobile Commercial Syndicate, Ltd.; Burlington Carriage Co., Ltd.; Cann, Ltd.; Clément-Talbot, Ltd.; Coventry Chain Co., Ltd.; Connolly Bros.; Cupelle Motors, Ltd.; Dixon Bros. and Hutchison, Ltd.; Delaunay-Belleville; Donne and Willans, Ltd.; Dixi Motors, Ltd.; W. T. Flather, Ltd.; Walter Gutmann; Harman and Co.; Hercules Motor Wagon Co., Ltd.; H. M. Hobson, Ltd.; Horsfall and Bickham; Immisch Launch and Boat Co., Ltd.; London and Parisian Motor Co., Ltd.; New Engine Co.; H. J. Mulliner; Mulliner's Carriage Building and Motor Co., Ltd.; Peto and Radford, Ltd.; Regent Motor Co.; Royce, Ltd.; Kotherham and Sons; Rubery and Co.; Simpson, Strickland and Co., Ltd.; W. and F. Thorn; Victoria Carriage Works, Ltd.; Weldhen and Blieriot; Whitlock Automobile Co., Ltd.



THERE are few more beautiful tracts of country in the near neighbourhood of London than the stretch of fir and pine landscape that covers the quadrilateral between Walton, Cobham, Weybridge, and Ripley. It is a particularly favoured district, and deservedly so, with automobilists, and many of them who run through Weybridge, Walton, or Cobham have been in the habit of making a round by crossing the bridge over the Wey river at Byfleet. It is well to warn any such that by one of those mysterious arrangements in accordance with which our local affairs are conducted, this bridge is now closed to traffic. For a long time the District Council has determined to rebuild it. They have selected

an occasion when unusually high water prevents any effective operations on the bridge being carried out. But as they intended to commence them at a certain date, they have closed the bridge, and they intend to keep it closed for three months, though a bridge of the type that is being erected could, it is understood, be put up in about three weeks. A better commentary on the absurdity of allowing local authorities of the calibre of district councillors to exercise autocracy in regard to road affairs, and the need of supervising their vagaries by a central authority, could hardly be asked for—or suffered from.

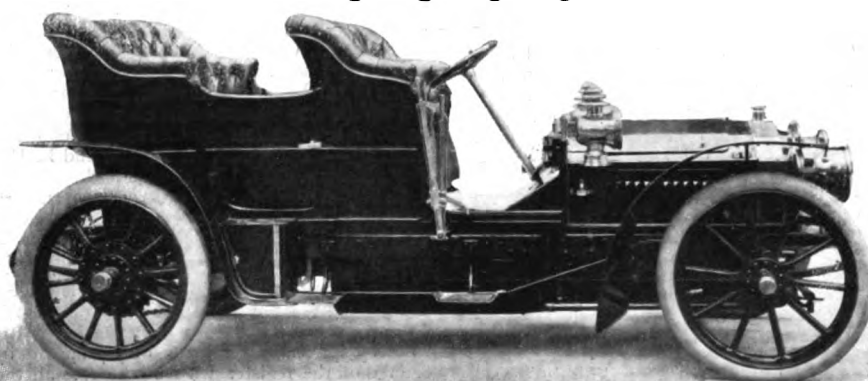
MOTOR BOATING.

Motor Boat Reliability Trials.—We have received a revision of the provisional rules for this trial, which takes place on July 4th and 5th next, in which some slight alterations have been made since we published the details of the rules in our issue of December 10th last. The only alterations are in the classification and entrance fees. A new class has been added, viz., Class VII., for *bona fide* sea-going motor yachts of any dimensions fitted with permanent cabin accommodation. The entrance fee for this class is 5s. per foot of water line. In regard to the fees in all the classes, an amount of the entrance fee proportionate to the number of entries will be returned in the case of each boat actually starting in the trials. This amount will in no case exceed 50 per cent. of the fee. The date for entries at the minimum fees is May 27th. Entries received from that date to June 10th will be subject to an increase of 25 per cent. Boats entered in Class

VII. must show a mean speed for the whole 20 hours' trial of 4 knots.

Monaco Motor Boat Meeting.—Whilst Mr. Arthur Macdonald will steer one of the Napier racing boats at the Monaco meeting, Mr. Seaton Edge, brother of Mr. S. F. Edge, will have charge of the other Napier craft.

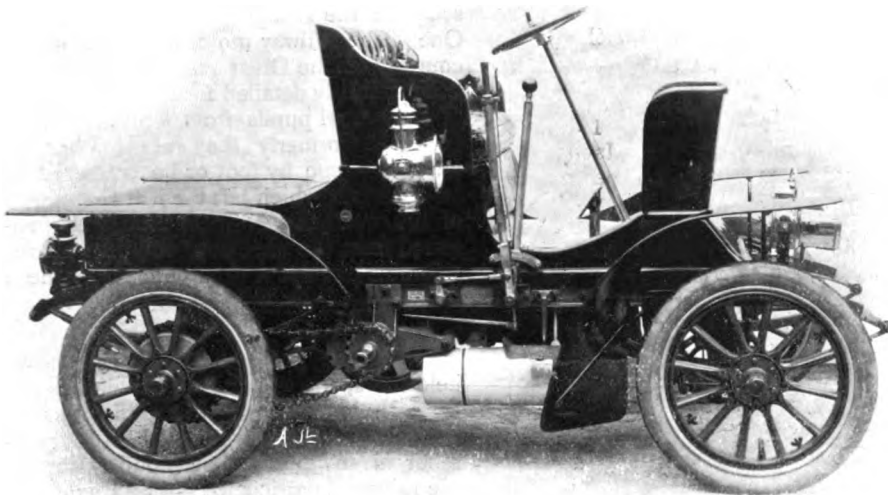
During the last two months there has been an agitation in France for the founding of a national nautical week at Havre, similar to the great yachting weeks at Cowes, Kiel, and Ostend. It has now been determined to institute a big meeting from July 29th to August 6th next, when, in addition to races for yachts and other sailing boats, special attention is to be given to motor boats. President Loubet, in all probability, will be present during these nautical fêtes.



The very latest type of side entrance Roi des Belges Crossley Car is shown in our photograph above. The car is fitted with a 22.28-h.p. motor, and the carriage body work is by Messrs. Rothschild. Leaf-springs, instead of dumb-irons, are used for supporting the back ends of the rear-springs. The position of the carriage body in relation to the wheel base increases the important appearance of the carriage. It will be noticed that the rear wheels are set well out at the back of the body, so that the body is suspended between the wheels instead of extending behind the back wheels. This system tends to steady the car on the roughest roads, and at the same time minimise side-slip dangers. Ample seating accommodation is provided for five persons.

THE Oldsmobile has for long found considerable favour with country doctors, so that special interest attaches to the experiences which Dr. M. W. Roe sends from Cornwall, where he has had one of the old 5-h.p. models in constant use for just over a year. Mr. Roe became owner of the car in February, 1904, and at that date he had on previous acquaintanceship with automobilism of any kind, notwithstanding which he undertook with praiseworthy enterprise the management of the car single handed. The district in which Mr. Roe carries on his practice is an exceptionally hilly one, and a large proportion of his work is done at night, in all sorts of weather, including frost and snow. During the twelve months Mr. Roe has had the Oldsmobile he has covered 4,572 miles, and only had seven involuntary stops. As a result of the admirable way in which the little car has behaved, Mr. Roe has been enabled to get through an exceptionally heavy winter's work without an assistant—in itself a testimonial to the value of the Oldsmobile which country doctors will appreciate. The reliability of the car, and the fact that it is always ready to start at a moment's notice, and negotiate the roughest roads, disposes of half the worry in a country practitioner's life.

THE latest number of the *White Bulletin* is mainly devoted to a record of the triumphs of the White cars during 1903 and 1904. These include track records made at Los Angeles and San José, and a description of the great Endurance Run, in which, as will be remembered, the endurance was equally for the cars and of the drivers against the atmospheric conditions prevailing, and in which two White cars arrived at Pittsburg first. In the 1904 record was included not only the St. Louis tour, but the various trophies won at the Exhibition itself. The *Bulletin* ends with an account of the triumph already recorded in 1905 by a White car at the Eagle Rock Climb. The *Bulletin* points out that the rapid success of the White car is largely due to the fact that it has been manufactured by a company for a long time engaged in the production of a high-grade mechanical product, and that the works, management, and organisation was consequently all there from the start. It is interesting to learn that at the present moment the parts of the White car not made from the raw material actually in the White works can be counted on the fingers.



At the time that we gave our fully illustrated description of the very interesting, and in many ways unique, petrol cars now being built—under license of Messrs. Lea and Francis—by Messrs. Singer and Company, of Coventry, we were unable to include amongst our numerous illustrations a good side view of the 8-h.p. car. The above photograph, however, shows it from the “off” side, and gives an excellent idea of the shape of the body and of the dashboard.

THE King of Italy has honoured the Automobile Club of Italy by according the club his patronage, whilst the Princess Lœtitia has become an honorary member of the A.C. of Turin.

THE Central Motor Car Company are very angry, naturally enough, at the police and magisterial treatment which has befallen one of their customers. A short time back, they write us, a purchaser of one of their cars was lunching at the Star and Garter at Richmond, and while he was thus occupied, some numskull of a practical joker removed the front number plate from his car. Its absence was not noticed, except by a policeman, with the result that the driver was haled before a magistrate, fined £1, and his licence endorsed—the magistrate refusing to listen to or, at any rate, admit the explanation. The Central Motor Company indignantly declare that “surely there ought to be some remedy against arbitrary treatment of this sort.” Well, the only remedy we know is to join the Motor Union and appeal to Quarter Sessions, though the process, even when the Union assists, is an expensive amusement. In the meantime we would recommend making cars, and particularly their numbers, as proof against practical jokers as possible.

THE National Swiss Automobile and Cycle Exhibition, with a foreign section, which is being held for the first time at Geneva, from April 29th to May 7th, although small, promises to achieve considerable success, a very great amount of space in excess of that available having been applied for. In addition to the Exhibition,

fêtes are to be organised and a big lottery instituted.}

EVERYTHING appears to point to a remarkably rapid growth in the popularity of 6-cylinder engines, both for cars and for boats, during the present year, and certainly engines of this type are proving themselves to have many advantages. As showing the remarkable flexibility they possess, the recent performance of a 30-h.p. Napier is significant, for it was driven, on the top-gear, by its owner—Mr. Arthur Brown, of Luton—from inside the garage in Regent Street the whole way to Coventry, and into a garage in the centre of that town without disengaging the clutch or allowing it to slip, and without using the brake. All necessary variations of speed and power were obtained by regulating the throttle-valve, the distance covered being 91½ miles. Engines having 6 cylinders

appear not only to give extremely quiet and smooth running, but—above a certain power—to also give the greatest output in relationship to weight.



The Marquis of Tweeddale is an enthusiastic automobilist. He has recently acquired a 28-30-h.p. 4-cylinder Napier Car, which is the second Napier vehicle of which he has been the owner. The photograph which we are enabled to reproduce above, shows him at the steering wheel of the new car, with the Marchioness of Tweeddale and their son, the Earl of Gifford, in the tonneau. Both the Marchioness and Lord Gifford share the Marquis of Tweeddale's enthusiasm for automobilism, and good use is made of the car, particularly in the South of Scotland, where the beautiful family estate is situated. The interest taken by the Marquis of Tweeddale in other branches of automobilism, and his general progressive tendencies, are shown by his adoption of the mechanical agricultural motor for farm purposes, while his Haddingtonshire seat was the first house in Scotland to be lighted by electricity.



The above Van, which is one of the Thornycroft commercial vehicles that are dealt with in another column, has been built for the British Vacuum Cleaner Company. The cleaning plant, inside the body, can be operated by the same 20-h.p. 4-cylinder engine that drives the vehicle, and there is seating accommodation—at the back as well as in front—for five persons. The car, which has solid rubber tyres, is geared to run at an average speed of about 15 miles per hour.

Olympia Motor Exhibition.—The date now definitely fixed for the holding of the next Exhibition of the Society of Motor Manufacturers and Traders at Olympia is November 17th to 25th, both days inclusive.

MARCH 24th to 31st, 1906, has been selected by Messrs. Cordingley and Co. as the date for their next Exhibition at the Agricultural Hall.

ON Monday last a serious fire broke out at the Dunlop Tyre Works at Aston Cross, Birmingham, damage resulting to the extent of about £5,000. The conflagration started soon after the dinner hour, in one of the "spreading" rooms. Fortunately the outbreak was restricted to the one department, and we understand that business will not be interrupted in the smallest degree.

MR. F. THORESBY, the general manager of the Car and General Insurance Corporation, Limited, writes us as follows:—

"In consequence of the circulation of an inexplicable rumour that we were badly hit over the Long Acre fire, and the many times I have had to contradict this statement, would you publish my assurance that this Corporation was not interested in any way? None of the cars destroyed or damaged were insured with this Corporation, I am happy to say."

A MOTOR omnibus is to be run by the Leeds Corporation Tramways Company in place of the present horse omnibus running between Far Headingley Tramway Terminus and Adel. This has been mainly brought about by an offer from the Headingley Golf Club to contribute towards any loss which may be sustained by the running of the omnibus up to £65 per annum for a period of three years. Another motor omnibus is also to be run between Farnleigh village and the tramway terminus.

THERE will be fewer truants from school in the Llangollen district in future. One of the railway motor cars has, by the courtesy of the Great Western Company, been specially detailed for the conveyance of the school pupils from Chirk to Llangollen. Formerly they used either to have to come by foot or be conveyed in an open cart which left them at the mercy of the weather. Now they are well protected from the elements, and gain a considerable amount of time on each journey.

OWING to previous motor car shows held there, the automobile public has a very lively sense of the difficulties of approaching the Crystal Palace by any other means than an automobile, most of the railways, particularly the Chatham and South-Eastern, making ludicrous detours in order to arrive there. In fact, on the latter line, when one is at Denmark Hill one is more than half way from Ludgate Hill to the Crystal Palace by road, but less than a third of the distance by rail. People who wish to visit the Palace will, therefore, be delighted to learn that a service of 24-h.p. Thornycroft motor 'buses' is being organised to scale the

range of hills on which the Palace is situated, and to conduct those who wish to visit it in comfort and celerity to the Sydenham heights.

AT Worthing, as an Easter attraction, Mr. G. H. Warne, the proprietor of Warne's Hotel, who is so well known amongst automobilists throughout the country, has arranged to hold a grand decorated motor carnival, when prizes to the total value of £100 will be offered for competitions which will include the best decorated motor car with over 8 ft. wheel base, the best decorated car under 8 ft. wheel base, &c.

THE London County Council, which watches over the future of London traffic with a paternal eye, a little time ago sent the chairman of the Highways Committee to inspect the rapid transit subways of New York. He has recently furnished a report—admirably illustrated—which may be generally described as a hymn of praise in favour of electric traction in shallow subways. It is quite possible that shallow subways may prove one of the best methods of solving the London traffic problem, but we do not see any reason why the subways should be restricted to electric traction. It is the shallow subway that is the thing.

The German Automobile Industry.—That the industry of the German Empire is making the most satisfactory progress is proved by statistics published for the last three years. The exports from Germany to Great Britain were in 1904 a good deal more than double what they were in 1903, and the exports to France increased in almost greater proportion. The great increase in the exports to France is rather remarkable, and is an indication that the pre-eminence of the French Republic in automobile manufacture is being threatened from more than one direction.

COMMERCIAL POINTS.

The Long Acre Fire.—Mr. Harvey Du Cros, jun., has now secured premises in Long Acre in close proximity to those burned out recently. The show rooms of the Mercedes, Ariel, and Swift cars are now, therefore, at 130, Long Acre, and the offices at 127.

THE coachbuilders' strike in Paris should, to a certain extent, benefit the British coachbuilder, as agents and makers on this side of the Channel cannot afford to wait whilst the internal dissensions, which at present have culminated so unpleasantly, are settled in France. Mr. E. H. Lancaster, who has just returned from Paris for this reason, has found it necessary to cancel all his contracts made with the French coachbuilders. This step will cause some small alterations in the prices quoted in catalogue for Clément carriage bodies, but, in order that his customers may not be disappointed or inconvenienced, Mr. Lancaster has arranged for some of these Cléments to come over to England with unfinished bodies, the completing touches being performed in this country.

THE garage and repair establishment hitherto known as the Kingston Motor and Cycle Company, at 27A and 29, High Street, Kingston-on-Thames, has recently changed hands and is now known as the Kingston Motor Works, the management being placed by the proprietor in the hands of Mr. F. Flutter. For the future the business is to be run on thoroughly up-to-date lines, a full range of tyres and accessories being always kept in stock. The premises are being enlarged to give room for 30 cars. At present there is accommodation for 12 to 20 cars. Pressing work can be executed at any time during the night, and the situation of this garage on such an important main road should be of considerable help to motorists passing through the district.

THE quality of the engineering work in the Brotherhood car attracted considerable attention amongst engineering critics at the Olympia Exhibition, and we learn that amongst those who have now secured cars built by Brotherhood Crocker Motors, Limited, is Mr. R. H. Fowler, of the well-known Leeds engineering firm of Messrs. John Fowler and Company. Every car it is possible for the Brotherhood Company to turn out up to the end of August has already been sold to private buyers, and amongst those who are to be numbered as users of this new model are the Earl Amherst, the Earl Fitzwilliam, the Hon. Charles Forrester, the Hon. W. W. Vivian, and Sir Max Waechter.

LORD NEWPORT is amongst the latest who have placed an order with Messrs. Charles Jarrott and Letts for a 22-28-h.p. Crossley Landaulette, the carriage body being specially built by Messrs. Hooper and Co., of St. James' Street. Sir Owen Roberts has also selected a similar landaulette for the special use of Lady Roberts.

THE Reilloc Tyre Company (Limited), owing to the large increase in their business have been compelled to move into more extensive premises at 120, Victoria Street, Westminster, S.W.

AN examination of the tyres fitted to the cars on view at the Liverpool Show resulted, we are informed, in demonstrating that Dunlops largely predominated in point of numbers.

AN artistically got-up catalogue has reached us from Messrs. Mann and Overtons, which contains very full particulars of the Richard-Brasier motor cars, for which this firm are the sole concessionaires in Great Britain and the Colonies. The front cover of this catalogue we reproduce elsewhere; it is, as will be seen, a vivid conception of Théry winning the Gordon-Bennett Cup. The Richard-Brasier chassis for 1905 are made in four sizes, viz., 12-16-h.p., 16-20-h.p., 24-30-h.p., and 40-50-h.p., all of which have 4-cylinder engines.

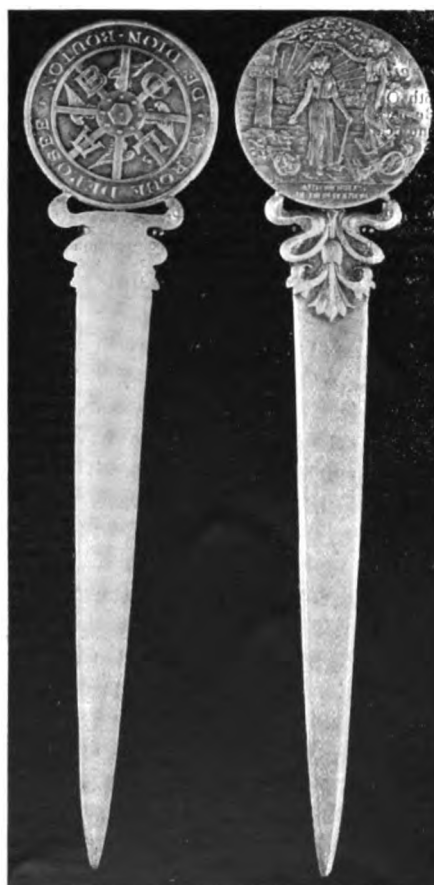
To meet the demand for a more popular priced car, Messrs. Mann and Overton are also marketing the "Unic" car, which is made in two lengths of chassis.

A NEW motor-house has been opened in New Steine, St. James Street, Brighton, under the title of the Brighton and South Coast Motor Garages, Limited, in connection with the Fiat Motors, Limited, of Long Acre and the Royal York Hotel, Brighton. The building is lighted by electricity, and heated night and day to a temperature of 65 deg. There are bedrooms for drivers, workshops,

a forge, stores, inspection pits, twenty private lock-up compartments for cars, and accommodation for washing half-a-dozen cars at a time. In addition, there are two private telephones—one to the Royal York Hotel and the other to the Metropole. A competent staff of mechanics will be retained. The new garage should prove a great convenience to motorists visiting the South Coast town.

A STRIKING proof of the growth of the motor car tyre industry is afforded by some statistics with which the Continental Caoutchouc and Gutta Percha Company, of Hanover, have recently furnished us. The total number of workmen employed by this firm was on the 31st December, 1903, 2,741. In December, 1904, the number of employes totalled 3,294. This represents an increase of approximately 20 per cent. in one year, a sufficient guarantee of the increased output of tyres which this well-known company is making. The important position of the Continental tyres in British automobile circles has been well illustrated by the Automobile Show at the Agricultural Hall, where the "Continental" labels are to be found at nearly every stall.

MR. HENRY M. LELAND has joined the Cadillac Automobile Company, as general manager of that prominent concern, where his special fitness for the work should bring practical results in the construction and general finish of the Cadillac cars. Mr. Leland was the vice-president and general manager of the Leland and Faulconer Manufacturing Company—the "Crossleys" of America—and has been at the head of large manufacturing interests for nearly forty years. He was with Brown and Sharpe for seventeen years as manager, and he was the founder of the well-known Leland and Faulconer Manufacturing Company.



From the De Dion Bouton Company, we mentioned recently having received a new catalogue. This was accompanied by a very tastefully designed metal paper-knife, which has been issued by the Company to their friends. We reproduce, above, reduced pictures of this little desk companion, the design of which is, it will be seen, particularly artistic.

British Exports and Imports of Motor Cars, &c., for 1905.

1905.	Exports, British and Irish make.					Foreign and Colonial Re-exportation.				
	No. of Cars and Value.	Parts Value.	No. of Motor Cycles and Value.	Parts Value.		No. of Cars and Value.	Parts Value.	No. of Cycles and Value.	Parts Value.	
January ...	77	£ 25,590	£ 7,480	58	£ 2,026	50	£ 19,006	£ 2,733	8	£ 214
February ...	62	20,209	6,335	63	2,389	79	39,772	4,532	2	54
Total ...	139	45,799	13,815	121	4,415	129	58,778	7,265	10	268

NOTE.—For 1904 comparative figures see full table for the year in our issue for January 21st, page 91.

Imports.

1905.	No. of Cars and Value.	Parts Value.	No. of Motor Cycles and Value.	Parts Value.
January ...	362	£ 149,578	57	£ 1,842
February ...	431	195,978	102	3,748
Total ...	793	345,556	159	5,590

NEW COMPANIES REGISTERED.

Automobile Wheel Company (Limited), 146, Wyndham Road, Camberwell, S.E.—Capital, £2,500 in £1 shares. Object, to acquire the business formerly carried on by the Artillery Wheel Works, Limited, at 146, Wyndham Road, Camberwell, S.E., and elsewhere. First directors, W. Pritchard and H. S. W. Pennington.

Simplex Motor Syndicate (Limited), 83, Upper Thames Street, E.C.—Capital, £1,200 in £1 shares (600 "A" and 600 "B"). Object, to acquire certain patents and rights relating to improvements in internal combustion engines, &c. First directors, J. D. Roots, F. W. R. D. Dewdney, and C. T. Craig.



BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, 232, Strand, W.C.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

21488. 6th October, 1904. Improvements in Liquid Fuel Burners for Heating Purposes. H. H. Lake. Communicated by B. F. Jackson, 30, Buckingham Street, Boston, U.S.A. The object of this invention is to obtain an intense heat from the hydro-carbon fluid delivered under pressure to the burner. There is one figure, a part sectional elevation. The chamber, 5, has the inlet shoulder, 6, and the outlet shoulder, 7. The tapering tube, 8, extends through the wall of the chamber, 5, having the contracted end extending through the shoulder, 7. Surrounding the tube, 8, and concentric with it is

and the inlet, 23, connected with the fluid fuel supply. The nipple, 17, connects to the elbow, 25, the union, 26, and the pipe, 27, having at its end the valve-seat, 29. The tee, 28, is screwed to the pipe, 27, and is fitted with a screw-down valve, 31. The end, 30, is connected by the pipe, 40, to the branch, 37. The inlet, 33, and the branch, 39, are connected to the fuel supply tank. Pressure, either air or steam, passes through the branch, 38, and forces the liquid fuel through the pipe connecting to 23 and valve-seat, 29, while some of the pressure passes through the tube, 40, the inlet, 30, and by the valve, 29, and by the connections to the tee, 14, the valves, 24, 31, and 34, being suitably adjusted. A suction will be exerted in the tube end, 20, to draw through the fluid fuel, and both steam and fuel are injected into the tube, 13, and at the point, 9, they are subjected to the action of the annular stream of steam or air issuing from the sleeve, 10, coming from the pipe, 32. The gas and spray are supplied to the Bunsen tube, 41, and burned as usual in such tubes, air entering through the perforations, 42, 43, the flame issuing from the end, 44. The tube, 41, is shown broken off. March 16th, 1905.

1324. 23rd January, 1905. Improvements in Terminal Rods or Conductors of Sparking Plugs for Internal Combustion or Explosion Engines. F. R. Simms, Kimberley Road, Willesden Lane, Kilburn, N.W., and another. This invention has for its object a simplified arrangement of terminal rod that can be more easily adjusted to the proper sparking position. There are six figures. Figure 1 is a section in the central plane, and Figure 2 is an end view. The sparking plug body, a, is of brass, having the usual thread to screw into the combustion

slotting the end of a piece of metal rod already turned with a shoulder, c, having first bored the end of the rod as far as the shoulder. The segmental strips are then bent over radially outward, and folded to bring them to the form, as shown in Figures 1 and 2. March 16th, 1905.

Patent Specifications Published.

Applied for in 1903.

Published March 30th, 1905.
26,403. J. CLAY. Combustible mixtures.

Applied for in 1904.

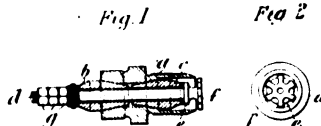
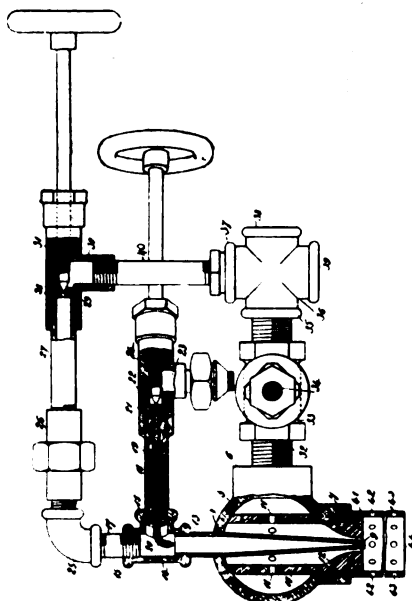
Published March 16th, 1905.
4,945. H. J. HARDING. Driving mechanism.
6,191. J. C. PHILON and R. MOORE. Speed gear.
7,517. R. BUGGE. Brakes.
8,004. H. DAHL. Speed indicators.
9,233. F. REDDAWAY. Pneumatic tyres.
14,165. J. BRONS and N. TIMMER. Oil engines.
14,884. J. S. PHILLIPS. Spring wheels.
19,813. J. HARTOCH. Vaporisers.
21,283. H. T. BROWN. Steering apparatus.
24,160. J. S. LOSCH. Explosion engines.
27,994. N. VARIOT. Automatic supply of explosive mixture.
28,644. R. J. SCOTT. Vaporisation apparatus.

Published March 23rd, 1905.

4,744. A. G. ROSSER. Anti-skid device.
4,954. A. CLEMENT. Valve mechanism.
5,819. W. POLAND. Carburetors.
7,302. W. H. BARRETT. Braking mechanism.
9,045. E. WALDEN. Dust preventer.
9,279. J. C. MERRYWEATHER. Automobile fire engine.
9,486. SOC. MALECOT. Airships.
9,624. WOLSELEY TOOL AND MOTOR CAR COMPANY (LIMITED), AND H. AUSTIN. Engine frame and gear.
9,659. GENERAL ELECTRIC COMPANY. Governors.
9,821. T. B. FULLER. Internal combustion engines.
10,064. IVEL MOTORS (LIMITED), AND D. ALBONE. Lubricators.
23,086. H. ANDREW. Non-skidding tyre.
27,747. SOC. DECAUVILLE AINE. Carburetors.
24,286. H. A. PALMER. Pneumatic tyres.

Applied for in 1905.

Published March 2nd, 1905.
287. TANGYE'S (LIMITED) AND T. I. SANDERS. Engines.
Published March 16th, 1905.
1,324. F. R. SIMMS AND R. BOSCH. Sparking plugs.



chamber wall. It is formed internally with two conical surfaces, in which are fitted two conical insulating plugs, b and c, of stellite, carrying the terminal rod or conductor, d. The conductor, d, is made of nickel, and fits within the insulator, b and c. The conductor, d, is provided with the head, f, the shoulder, e, which abuts against the insulator, c, and a thread at the end, fitted with the nuts, g, which serve to hold the whole sparking plug together, and also as a terminal clamp for the conductor. So as to provide a number of sparking gaps, the head, f, has a number of projections usually formed by cutting notches in the end disc of the head, f. The head, f, in this invention is formed by longitudinally

the sleeve, 10, having the perforations, 11, placed opposite the inlet, 6. The sleeve, 10, has a narrow or contracted portion, 12, leaving an annular passage surrounding the point, 9, of the tube, 8. To the end, 13, of the tube, 8, is fitted the tee, 14, having a nipple, 17, fitted to the end, 15, and the tube, 18, to the end, 16. The tube, 18, has the atomiser, 19, fitted within it, with its end, 20, directed concentrically with the tube, 8. At its other end is the valve-seat, 21. The tube, 22, carries a screw-valve, 24,

The Automotor Journal, April 1st, 1905.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

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The Monaco Motor Boat Week, which commences to-morrow (Sunday) with the Exhibition at Monaco of the competing craft, and continues until the 16th of the month, is now one of the leading events of the year in aquatic automobilism. No less than 103 boats have been entered for the races this year, the starting point of which is opposite the celebrated Casino of Monte Carlo, a view of which, looking seaward, we reproduce above. A map of the course over which, in addition to the various valuable trophies, money prizes amounting to 116,000 francs will be competed for, was given by us in our number of the 18th ult.

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NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C., by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
Apl. 29 or May 1	May Day Parade
May 6...	Auto Cycle Club Hill Climb.
May 10-13	Scottish A.C. Reliability Trials.
May 12 or 19	*Quarterly 100 Miles Trials.
May 13	Auto Cycle Club Members' Penalty Run.
May 20	200 Miles Trial (Motor Cycling Club).
May 23	*Gordon-Bennett British Eliminating Trials.
May 23	Auto Cycle Trials and "Selection" Race.
May 10	*South Harting Hill-Climb (Members A.C.G.B.I.)
June 10	London-Edinburgh (Motor Cycling Club).
June 24	100 Miles Passenger Trial (Motor Cycling Club).
July 1	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 4-5	*Motor Boat Trials (Southampton).
July 8...	Auto Cycle Club Consumption Trial.
July 13	*Hill-Climb (Henry Edmunds Trophy).
July 19-22	*Brighton Speed Races.
July 27-28-29	*Blackpool Motor Meeting.
July ...	24 Hours Run (Motor Cycling Club).
Aug. 11 or 18	*Quarterly 100 Miles Trials.
Aug. 14-19	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 19	*Van Trials, Light and Heavy Vehicles.
Aug. 26	Inter-Team Trial (Motor Cycling Club).
Sept. 9	Brown Cup (Motor Cycling Club).
Sept. 12	Auto Cycle Club Race Meeting.
Sept. 14	*Tourist Trophy (Isle of Man).
Sept. 15	*Daily Graphic Cup (Isle of Man).
Sept. 18-Oct. 3	*Reliability Trials.
Oct. 4	*Speed Trials.
Nov. 10 or 17	*Quarterly 100 Miles Trials.
Nov. 17-25	Society of Motor Manufacturers and Traders Exhibition at Olympia.

* Automobile Club of Great Britain and Ireland Events and Papers.

Foreign Events (Trials, Races, &c.).

1905.	
Mar. 15-Apl. 9	Copenhagen Exhibition.
Mar. 27-Apl. 5	Washington Exhibition.
Apl. 2-16	Monaco Motor Boat Fortnight.
Apl. 14-23	Nice Automobile Week.
Apl. 17	Speed Mile and Kilometre (Nice).
Apl. 18	Coupe de Caters (Nice).
Apl. 20	Coupe Burton (Cannes).
Apl. 20-21	Cannes Motor Boat Meeting.
Apl. 23	Coupe Provinciale (Nice).
May	Paris Industrial Vehicles Trials (A.C. France).
May 4-12	Auto Cycle Club de France Tour.
May 11-25	Stockholm Automobile Exhibition.
June 16	French Selection Race for G.B.
June 18	International Motor Cycle Cup.
June 26	Mont Cenis Hill Climb.
July 5	Gordon-Bennett Race.
July 9-22	Ostende Automobile Meeting.
July 11	Start for Glidden Trophy (New York).
July 15	Calais-Ramsgate (Motor Boats).
Aug. 6-7	Circuit des Ardennes.
Aug. 6-9	Paris-Trouville (Motor Boats).
Aug. 10	Gaston Menier Cup (Motor Boats).
Aug. 10-16	Herkomer and Bleichroder Races.
Aug. 11	Anthony Drexel Cup (Motor Boats).
Aug. 12	International Cup for Motor Boats.
Sept....	Brescia Automobile Meeting.
Sept. ...	Vincenzo-Florio Cup.
Sept. 1	Lake Geneva Motor Boat Meeting.
Sept. ...	Tourist Car Trial (A. C. de France).
Sept. 3-10	Royan Meeting.
Sept. 3-10	Spa Automobile Club.
Sept. 11	British International Cup (Motor Boats Arcachon).
Sept. 12-14	Lake Lucerne Motor Boat Meeting.
Oct. 1	Chateau Thierry Hill Climb.
Oct. 15	Gaillon Hill Climb.

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PASSING EVENTS.

The Parks Speed Limit—A Manœuvre.

RECENT proceedings in Parliament throw a side, and not very pleasing, light on the kind of legality that is thought good enough for automobilists. It will be remembered by our readers that some time ago a number of cases for driving above the speed of ten miles an hour in the Parks, which the police desired to enforce, and to which end they had promulgated certain rules of their own, were brought against automobilists. Some of them now stand adjourned indefinitely, and one resulted in a conviction for the purpose of enabling the legality of the situation to be tested by appeal to the Divisional Court. The main ground of the defence was that, according to the Act, any regulations to have force must be duly laid before Parliament. The subsidiary regulations enforcing the 10 miles per hour limit were not properly promulgated in this way. The Treasury seemed to take a very special interest in the matter, and put up Mr. Bodkin to defend several of the cases. Altogether the proceedings were not conspicuous for fairness to the accused motorists, and were commented on by us at the time. Government circles now seem to have recognised that they have made a constitutional blunder about the Park Regulations, and in answer to a question by Sir C. Cayzer, Lord Balcarras has recently stated that the rules enforcing the 10-mile limit in the Parks had been duly laid before Parliament. As was clearly proved in court by a special Parliamentary official, there was nothing in the rules already laid before Parliament about 10 miles an hour. As no one can suppose that Lord Balcarras would have deliberately misled his questioner, or could be misinformed, it has been generally concluded that he was referring to new rules. Enquiry at the Houses of Parliament, however, on Monday last, elicited the fact that no new rules had been placed on the tables. The situation, therefore, is decidedly in need of clearing up. During the litigation that occurred, the absurdity of enforcing a 10-mile limit, under any circumstances, in the Parks, was made sufficiently apparent. It has been shown, over and over again, that far from benefiting anybody, the enforcement of so low a limit as 10 miles per hour simply congests ordinary traffic through the Parks. Considering the illegal and unconstitutional way in which automobilists have been treated, in regard to the question, it might at least be expected that, when attempting to legalise the situation, the Government would at any rate accord some relief and extension of the limit if only in the interests and for the comfort of other park users.

A Triumph for Progress.

It is not very long ago since we had occasion to hold up to well deserved contumely the district councils of Helston, and of other places in Cornwall, who had for the time being proved successful in putting a stop to the service of motor omnibuses which the Great Western Railway Company had organised in the Duchy. Fortunately, however, above the district councils, who are in most cases the highway authorities, stand the county councils, and, in general, county councillors are men of more enlightenment and common sense than the bovine quidnuncs who too often rule on the subsidiary bodies. The control of the funds, by means of which road repairs are carried out, rests, we believe, to a large extent with the

county councils, and this enables them, ultimately, to bring district councils who adopt eccentric views as to the proper procedure on highway matters, to some extent to their senses. The Cornwall County Council, recognising that the motor car service was to the benefit of the community generally, have refused to allow it to be interfered with by the reactionary tactics of the district councils, and though, of course, for the time being, these bodies might triumph, victory is bound to rest with the County Council in the end. The satisfactory result at any rate is that the district councils have been brought to their senses, that they will in future agree to roll the roads, and, above all, that the Great Western Railway Company will not only renew their suspended bus services, but add considerably to them. In fact, they are increasing their stud of motor buses by thirty additional vehicles, and will, altogether, possess, when these are completed, seventy-five different motor buses for carrying on their road services. Both the Railway Company and the county council are to be congratulated on this triumph of progress, as also are the inhabitants of Cornwall, who will once more benefit by the road car services, the interruption of which has forcibly compelled them to appreciate the great value and convenience of well-organised automobile transport.

The Electromobile in the Service of the Injured.

THAT the victim of an automobile accident should himself benefit in the more recent applications of automobilism is a unique occurrence, and we are able to chronicle what we believe is the first occasion on which it has taken place. We refer to the case of Captain Walker, who, about a month ago, sustained a fracture of the skull in a motor car accident at Kingston Hill. Captain Walker has now so far progressed that it was decided to remove him to his own house by means of an electromobile ambulance, the smooth and easy running of which enabled the transference to be successfully accomplished without injury to the patient at a much earlier point in his convalescence than would have been possible in the case of the old type of ambulance drawn by horses. The incident is suggestive of a very important sphere of employment for the electromobile. Its quietness and absence of vibration are, as everybody recognises, unequalled, and these characteristics are of particular value in ambulance work. It is probable, therefore, that, wherever possible, we shall, in the near future, see electric propulsion adopted for the use of all ambulances attached to hospitals, or at any rate to all the ambulances employed in connection with hospitals in the Metropolis.

The Tourist Trophy.

THE Automobile Club is to be congratulated on the satisfactory position of the legislative question regarding the eliminating trials of the Gordon-Bennett Race and the proposed race for the Tourist Trophy in the Isle of Man, particularly in view of the high amount of interest that the latter event is evoking amongst the automobile trade of this country. The number of entries for the Tourist Trophy is steadily increasing, and we may conclude from this fact that the actual numbers which will be booked to start when the race takes place will be very considerable indeed. This is as it should be, for as we have frequently pointed out, the race will possess some of the most valuable characteristics of the long and elaborate reliability trial, in testing the relative merits of

reasonably-powered cars for ordinary workaday use, while it will be over in a comparatively short space of time, and will combine with these advantages an amount of attraction and interest invariably associated with a real sporting event. One of its great advantages, at any rate as compared with the reliability trials, is the much shorter time that it will occupy, and that all the tediousness associated with the latter events will be got rid of. The fact of the trial being a real race—true, a race of an unique character—will be certain to have a marked effect on the public interest, and the numbers of spectators that will witness it. Everyone will remember how anxious the spectators always were in the case of the reliability trials to persuade themselves that the cars they saw starting were really racing, and how their faces usually fell when it was made clear to them that nothing in the nature of a race was intended. No such disillusionment will accompany the holding of the Tourist Trophy. The public will have this satisfaction, while a natural, though possibly illogical, consequence will be that to win the race or get a high place in it will be of much greater value to the competing firms than the highest possible marks in a reliability trial. That this is being recognised to the full is shown by the gradual regular increase in the number of entries for the race.

More Tram Prosecutions.

THE great principle on which all civic, and we might say all civilised, life reposes, is that what is sauce for the goose must be sauce for the gander—in other words, that exceptional treatment of any class of people cuts at the base of social order. Yet where locomotion is concerned, we are always witnessing this very kind of partiality on the part not only of the man in the street, who is naturally a victim of prejudice, but of our judicial and magisterial authorities, who ought to know better. When an automobilist exceeds the speed limit, or is proved to have been driving to the danger of the public, £5 is usually the smallest sum that he is fined. It is quite a different thing where the electric tram is concerned. Some time ago, when these popular conveyances were timed, the fact was established, as our readers will remember, not only that they regularly exceeded their permitted 12 miles an hour, but that they usually careered along at speeds that would be excessive in automobiles. Of course, the prosecutions which followed were looked upon partly in the light of a joke, which they undoubtedly were, and partly merely as an effort to vindicate a principle, and the drivers who were in consequence convicted after a prolonged fight, in which all the laurels—and expenses—were on the prosecutor's side, were let off with merely nominal penalties. But it would be simply a prejudiced abuse of magisterial power if mere nominal penalties are to be permanently allowed. We are, of course, referring to the recent prosecutions before Mr. Garrett of tram drivers in the south of London, for exceeding their legal limit of speed. The prosecutions were instituted by the London Omnibus Owners' Federation. Witnesses, instructed by the Company, had very carefully timed the vehicles and fully established that the speeds were excessive. Nevertheless, the magistrate let off the drivers with a nominal penalty of 10s. each and refused special costs. Now this sort of thing will not do at all. The situation is altogether altered since the days when Mr. Moffat Ford took up the question. The motor 'bus is becoming a competitor of the electric tram, and it is of importance

to the motor 'bus industry that its competitors should not be permitted to benefit by breaches of the law. If absurdly nominal penalties like 10s. only are to be inflicted, which of course the drivers will not pay, the law will be broken with impunity. Where a magistrate refuses to convict at all, there are ways of making him do his duty. It is doubtful whether anything can be done if he merely inflicts inadequate penalties. With the advent of the motor 'bus, the whole question becomes more serious than it perhaps at first sight appears. During the hearing of the case, unpleasant remarks were made to the effect that the prosecution was due to the petty jealousy of omnibus proprietors. That is not the way to put it at all. It is a most manifestly improper and unfair disadvantage to place the automobile 'bus under, if its most serious competitors are to be allowed to benefit pecuniarily by a systematic breach of laws made for the public protection.

The Late Jules Verne.

SINCE the appearance of our last number the whole civilised world, at any rate that portion of it which reads books, has experienced a pang of regret—a regret which will probably be particularly keenly felt by the scientifically imaginative boys and youths of all countries. Jules Verne has passed quietly away in the old town of Amiens, in which he had for so long resided, and of which he was perhaps the most distinguished citizen. Many a schoolboy will be hardly able to realise the world deprived of the existence of the great old man, whose wonderful gift of dealing imaginatively with scientific possibilities had made him the father and creator of the modern scientific romance, a department of literature in which, excepting possibly for the recent work of Mr. H. G. Wells, he would have stood alone and absolutely without a rival. It is not to the schoolboy only, however, that Jules Verne's work appeals. It makes a special appeal to everyone interested in the subjects with which we are particularly concerned. Before the modern submarine, the modern navigable balloon, and above all the automobile, were more than hazy dreams or crude experiments, the scientific imagination of the great Frenchman realised their possibilities. It is impossible to say how much he really invented, but that he helped invention to an enormous degree can hardly be doubted, for he had an amazing gift of popularisation, and it cannot be doubted that he has performed a great and splendid work for all departments of progress in stimulating inventive imagination particularly in youth, when it is of the greatest value that it should receive a stimulus. To say that, in addition to these great qualities, his work was characterised, practically throughout, by a high literary value, is only to say that he was a Frenchman of letters, and he has now joined the great and brilliant circle of grand old men who in this particular line of activity have done so much to contribute to the greatness and fame of the French nation. The literary and scientific population of the globe will join with the German Emperor in the graceful condolence which he dispatched on his journey south to the novelist's widow, for like the Emperor, nearly all can say that Jules Verne was the favourite author of their youth.

LADY ADELA COCHRANE, wife of the Deputy Governor of the Isle of Wight, is to inaugurate a service of motor 'buses for the principal routes in the island about Easter.

SIR RALPH GORE'S 100-H.P. MERCEDES.

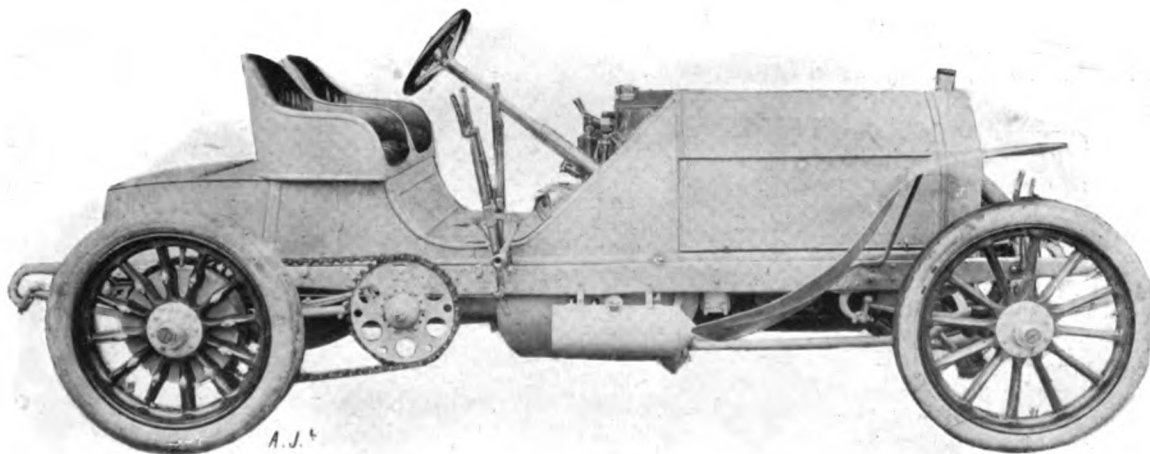


Fig. 1.—Side View of Sir Ralph Gore's 100-h.p. Mercedes Racer.

A CAR, which is very likely to create a sensation at some of the racing events during the coming season, is the 100-h.p. Mercedes, which has just been supplied by J. E. Hutton, Limited, to Sir Ralph St. G. Gore, Bart. The racer, of which we are able, through the courtesy of the owner, to give photographs, is the most powerful of the Mercedes cars in this country. In general design, it resembles the 90-h.p. and 60-h.p. models, and it has none of the innovations which were introduced on the recent 70-h.p. model, described by us on December 24th last.

A side view of the complete car, with its racing body, is given in Fig. 1, the engine is seen from both sides in Fig. 2, and Fig. 3 gives a view of the controlling levers and pedals. Standard Mercedes practice has been followed in general construction, so that in view of the exhaustive descriptions which we have given of the Mercedes system in the past, it is merely necessary to draw attention to the leading features of this car. It is fitted with a 4-cylinder engine, a gear-box of the ordinary Mercedes type, giving four forward speeds and a reverse, and the rear wheels are driven by side chains, the sprockets for which are at present fitted with 34 teeth.

The cylinders of the engine are cast in pairs, with the inlet-valves arranged in the cylinder-heads, operated from a cam-shaft by vertical push-rods and rock-levers fitted with adjustable tappets. The exhaust-valves are operated from vertical push-rods on the opposite side of the engine, and the inspection-covers above them are held in place by yokes. The low-tension igniters are fitted in the cylinder walls, and are operated from the inlet-valve cam-shaft. The gear-wheels operating the cam-shafts are exposed and are placed behind the engine.

The engine is governed on the throttle-valve, which is of the horizontal type, and is controlled by the "throttle" and "timing" levers which are fitted above the steering-wheel. There is, in addition, a foot-accelerator, which also acts on the throttle, and two pedals, instead of one, are fitted for the purpose. Referring to Fig. 3, it will be noticed that there are, in all, five foot-pedals under the driver's control, that on the right being the clutch-pedal. The other two large pedals act on the differential countershaft and second-motion-shaft-brakes, respectively. Between these large pedals, are

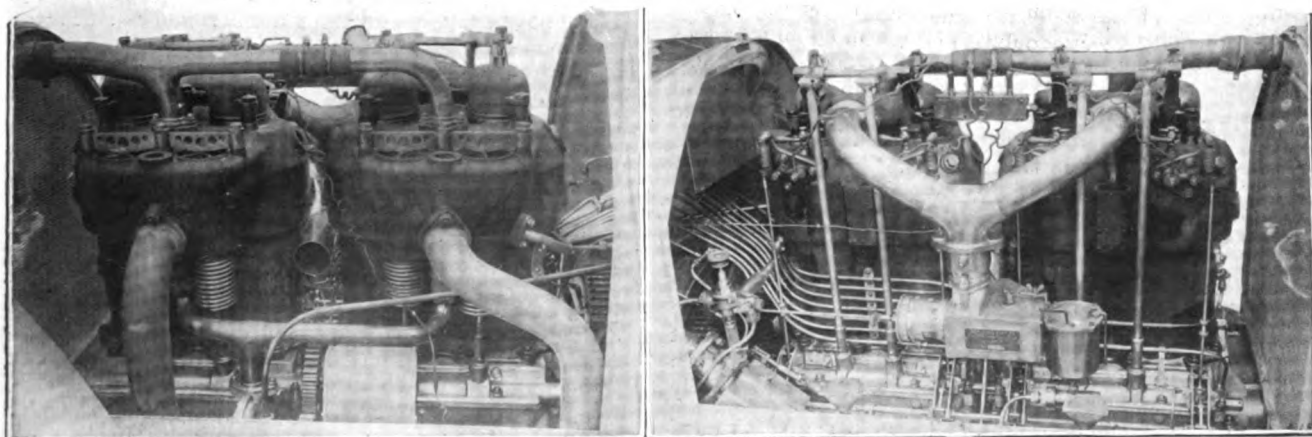


Fig. 2.—Views from either side of the 100-h.p. Engine on Sir Ralph Gore's Mercedes Racer. The left-hand view shows the engine from the exhaust-valve side, and indicates the positions of the magneto and circulating pump. The other view shows the position of the carburettor, and the wire operating the butterfly valve in the induction pipe is also visible.

the two accelerator-pedals which open up the throttle-valve; they are rigidly connected together and have been provided in duplicate merely for convenience in driving. Attached to the steering column is a ring, also visible in Fig. 3, which is connected to a wire operating a butterfly-valve in the induction-pipe. By unhooking this wire from the steering column, the engine may be stopped, for it then allows the butterfly-valve to close. The ordinary throttle-valve, when "closed," permits the engine to run slowly, so that the additional valve is necessary if the driver wishes to stop his engine by shutting off the mixture.

The chassis is of considerable length, with a wheel-base of 9 ft. 3½ in., and a track of 4 ft. 10 in.; the weight, however, is, we understand, within the 1,000 kilograms limit.



Fig. 3.—View showing the controlling lever and pedals on Sir Ralph Gore's 100-h.p. Mercedes racer. The two accelerator pedals are interconnected, and act on the throttle. The other three pedals are for the two brakes and the clutch. The wire controlling the butterfly valve in the induction pipe ends in a ring, which is visible above, hooked to the steering column.

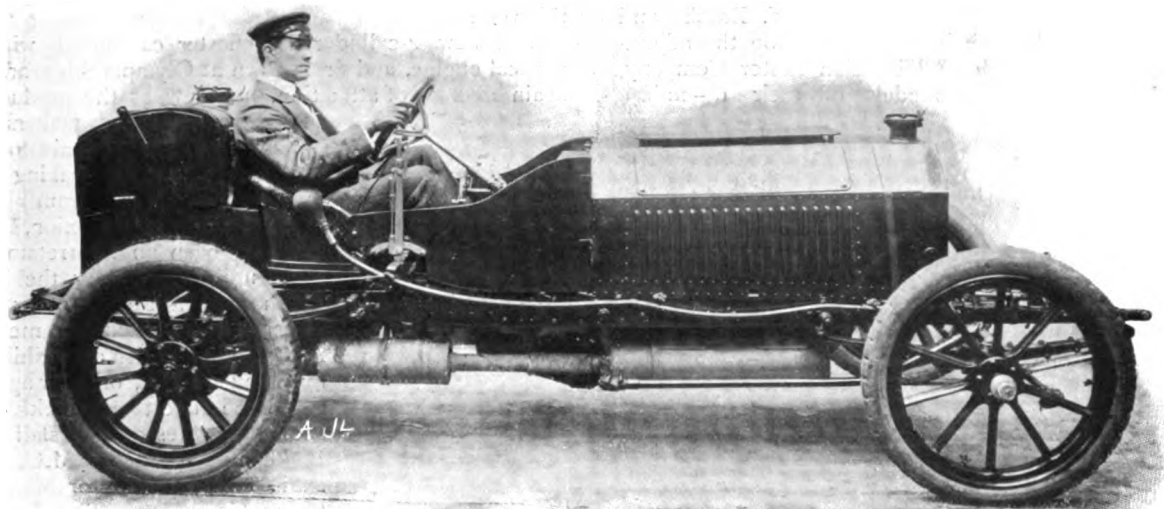
WE have for some time harboured the intention of arranging to give an account and the results of the great racing events of the year, *before* they actually take place. Nothing less than this would secure our being really up-to-date. Why should we wait till everybody knows all the facts? The intelligent anticipation of events is so much more interesting! But, alas! we have been forestalled by our comic German contemporary, *Das Schnauferl*, which, grasping the situation in all its bearings, has already produced a full account of this year's Gordon-Bennett Race in advance. The amusing description is excellently illustrated, showing President Loubet viewing the race, a number of the competitors tearing along at different points, and all the rest of it, the whole description of the race being thoroughly realistic and highly elaborated, and forming an excellent parody on some of the sensational "advance" announcements and accounts which are usually published in connection with events of importance. Journalistic enterprise can hardly go further, at any rate, as far as being first in the field is concerned.

SOME cases of general interest to automobilists have been brought before the Metropolitan magistrates by the London County Council. When the holder of a licence applies for its renewal it is ordained by the Act that he shall give particulars of any endorsements on it, so that they may be applied to his new licence. To omit to do this is, of course, an offence under the Act, and legally would involve a maximum penalty of £20. Several cases have occurred in which automobilists have pleaded ignorance when charged with this omission, and the County Council licensing authorities, instead of pointing out to them what they ought to do, have at once pro-

ceeded against them. This they are presumably entitled legally to do, and considering the circumstances—namely, that a motorist must either send in his old licence for renewal, or else fill up a form in which four out of the eight questions asked bear on this subject—we think they have done wisely in thus taking drastic steps to check such palpable evasion of the regulations—evasions, of which only the undesirable would be knowingly guilty.

FROM time to time there is a flourish of trumpets about a new accumulator, which is nearly always just half the weight of any of its predecessors, and is, of course, going to revolutionise the electromobile industry. There has been a cessation of these rumours since the Edison accumulator turned out to be not all that was anticipated. Recently a statement came from Paris that the veteran electromobilist, M. Jeantaud, has at length invented an ideal accumulator. Needless to say, it is described as being half the weight of all its competitors, though from the few details published, that claim can, it would seem, hardly be substantiated. One of the cells, discharged to 1.70 volts—a very low point—at a little over a 7½-hour rate, is said to have yielded 41.2 Watt hours per kilogram. This, though a distinct gain on anything that has been accomplished hitherto (if the figures are commercially reliable), is not an amazing improvement, even on what has been done with lead cells, and does not amount to anything like diminishing the weight by half. However, we await details of the new cell with interest, for at present there is nothing to show whether an entirely novel principle is involved or whether the improved effects obtained are simply due to some better method of constructing a pasted lead cell.

GORDON-BENNETT RACERS FOR 1905.—MR. CECIL EDGE'S 80-H.P. NAPIER.



Mr. Cecil Edge and his 80-h.p. Gordon-Bennett Napier Racer.

OUR illustration shows Mr. Cecil Edge and the Napier car which he will drive in the Eliminating Trials in the Isle of Man this year. The chief features of this car are as follows:—The pressed nickel-steel frame is carried on springs that are mounted outside it, and are fitted in conjunction with a special device for neutralising the "rebound" on bad roads. As will be seen, the motor and the radiator—which is of the honeycomb type—are situated behind the front axle, to secure a good distribution of the weight on the four wheels, and there are aluminium wind-shields, on either side, between the dashboard and the seats. The wheel-base is 8 ft. 10½ ins., the track 4 ft. 7½ ins., and the petrol-tank—which forms the back of the driver's seat—has a sufficient capacity for running 200 miles.

The 80-h.p. 4-cylinder engine is of that Napier type in which separate cast-iron liners are forced into the aluminium jacket casting, and the cylinder-heads are cast in pairs with the inlet-valves above the exhaust-



EVERY fluctuation in the market value of horses, at any rate when the tendency is downward, is attributed to the automobile movement. Sometimes we are solemnly informed that the price of horses is as high as ever, and that the automobile has had no effect. This week we are told that the price of cart horses in Yorkshire has been seriously depressed by the new locomotion. Cart horses, after all, are the breed which one would expect to be affected last, and, as some very reliable figures of exactly the opposite kind were supplied to us and commented on not so very long ago, we are disposed to discredit this latest scare.

THE Bavarian town of Bayreuth has become almost an appanage of the Wagner family, and the great man's widow appears to rule there with much of the autocracy of a "Burgfrau" of the Middle Ages. She is very much opposed to automobilism, and no automobiles are consequently allowed within "hoot" of "Wahnfried." Any automobilists who intend visiting the Bayreuth Festival therefore are

valves. The engine is governed on the throttle-valve, subject to the control of a foot accelerator, and the hand-levers regulating the throttle-valve and the time of ignition are placed on the steering-pillar. A high-tension system of ignition is employed, the commutator and distributor for which are chain-driven on the dashboard, and, as an auxiliary to the drip-feed-lubricator for the engine, there is a separate oil-tank coupled up with a semi-rotary pump for the mechanician to force oil into the crank-chamber.

Special care has been taken to render the steering gear satisfactory, and the pillar is set at a considerable angle to enable the driver to sit in a comfortable position. The radiator has a fan fitted immediately behind it, the change-speed-gear provides three forward speeds with a "direct through-drive" to the back-axle on the top speed, and the tyres employed are of the Dunlop, corrugated, non-slipping type.



warned not to approach the classic spot by motor car. Opinions differ as to the reason of the lady's prejudice, but it is believed by some that in the early days of the movement, when the approach of an imperfectly-constructed machine resembled some kinds of orchestral music, that the sounds of one particularly rattlesome vehicle were confused by one of the audiences with a weird passage from the "Ride of the Valkyries," and applauded accordingly, to the chagrin of the great composer.

MOTOR Mountaineering was the subject of an interesting lecture, illustrated with Cinematograph and other pictures, by Capt. Deasy, at the Automobile Club on Thursday evening last. Capt. Deasy gave a very vivid description of his trip up the Rochers de Naye cogwheel railway in his car, and of his adventures when touring through the Alpine passes, a full account of which appeared at the time in the pages of THE AUTOMOTOR JOURNAL.

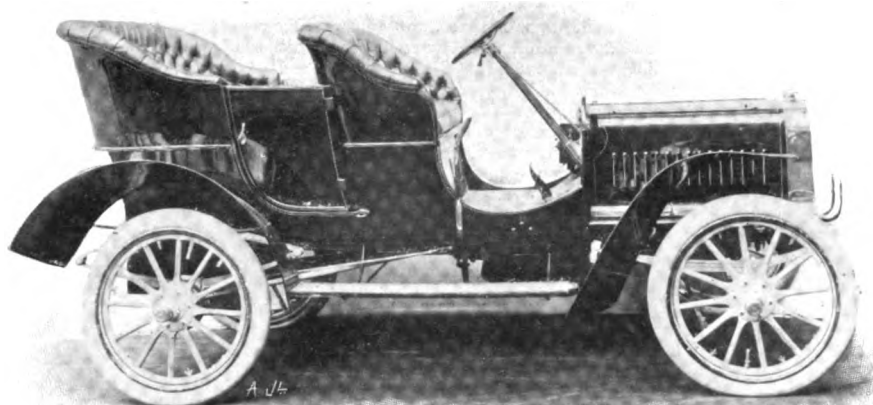
AGRICULTURAL HALL SHOW.

(Continued from p. 394.)

COMPARATIVELY few of the larger British manufacturers of touring cars were represented, but J. W. Brooke and Co. showed—both on their own stand or on the adjoining stand of the London and Parisian Motor Company, their London agents—models of their 15-20-h.p.

latest Maudslay models in our issue of January 11th this year.

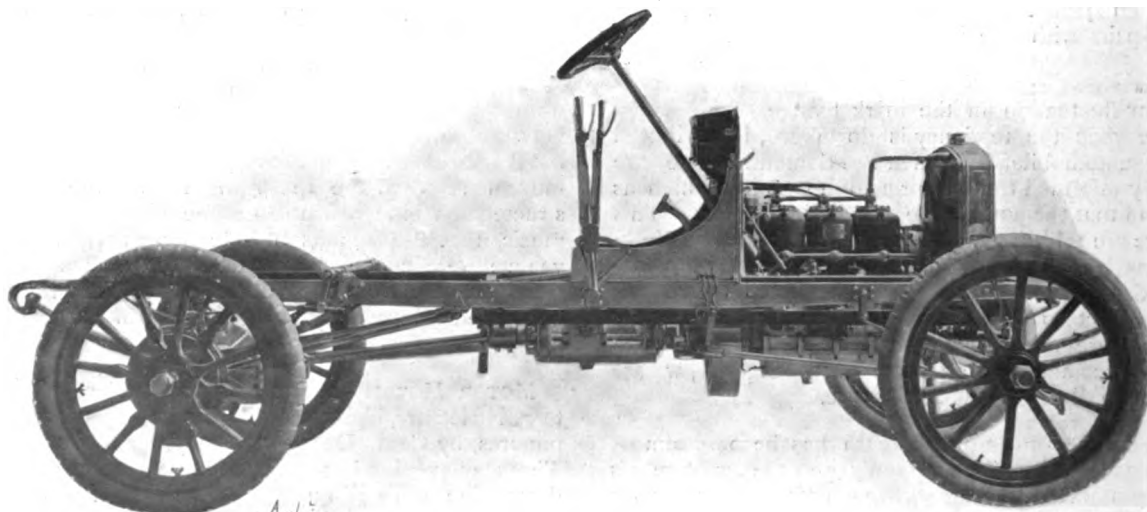
The new 4-cylinder Lanchester car fitted with a vertical engine, and first shown at Olympia this year, was again a centre of attraction, not only as the product of such well-known makers of horizontal engines, but also owing to the fact that in making this radical departure from their usual engine construction, they have yet been able to retain the same unique lines for the body which characterise the other and better-known Lanchester models. Among other British cars exhibited by manufacturers, or their agents, were the latest Horbick cars, shown by Messrs. Horsfall and Bickham, and the M.M.C. cars exhibited by the Motor Manufacturing Company. The London and Parisian Motor Company also exhibited Vulcan cars, constructed by the Vulcan Motor Co., of Southport, for which they have secured the London agency; and Lamb Brothers and Garnett showed the latest 18-22-h.p. National chassis,



AGRICULTURAL HALL SHOW.—The new "Ford" model has a 4-cylinder-vertical engine, fitted with copper water jackets, an epicyclic gear, and a live-rear axle driven by a propeller-shaft.

4-cylinder cars, the first of which type was, it will be remembered, a feature of the Agricultural Hall Show of 1904. These cars are fitted with the Brooke chain-gear, a fully illustrated description of which appeared in our issue of March 26th, 1904. In addition to these 15-20-h.p. cars, however, was the larger 35-h.p. chassis—now being described in our columns—which is fitted with a change-speed-gear of the sliding spur-wheel type. The Maudslay Motor Company exhibited a large selection of their well-made cars, including a 30-h.p. 4-cylinder chassis, a 27-h.p. 3-cylinder wagonette, and the 14-h.p. "all round" car, which was illustrated in connection with the full description which we gave of the

which is built by Rose Bros., of Gainsborough. This latest model is a thoroughly well-constructed and up-to-date car. It is among the minority with its 3-cylinder engine, but in other respects it embodies many of the most useful features of modern practice. The chassis is of the live-axle type, the rear wheels run on tubular extensions of the axle casing, and both foot and hand-brakes act on the hubs of the rear wheels. Enclosed universal joints, of particularly neat construction, are fitted at both ends of the propeller-shaft. The gear-box gives three forward speeds and a reverse, with a direct drive on the top speed, while the gear wheels are very accessible through a large, and easily detachable, inspection-cover. The clutch is of



AGRICULTURAL HALL SHOW.—Side view of the latest 18-22-h.p. "National" chassis, exhibited by Lamb Bros. and Garnett, which is of the live-axle-type, is fitted with a 3-cylinder engine, and has a gear-box of the sliding spur-wheel type giving three forward speeds and a reverse.

the external cone type, and is held in engagement by three equidistant springs. The carburettor is of the "automatic" type, and has, in addition to the auxiliary air-valve, a hand control on the jet, which allows the richness of the mixture to be directly varied. The two other levers above the steering-wheel regulate the "timing" and the variable lift of the inlet-valves respectively.

An important British exhibit was that of the Heatly-Gresham Engineering Company, who showed, for the first time, the "Rational" car, which was very fully illustrated and described in our issues of November 19th, &c., 1904. One of these cars, it will be remembered, gave a very good account of itself in the Bengal Reliability Trials, and secured the first prize (Leslie Cup) in its class. The principal features of interest in its construction are, the horizontal engine, the fool-proof two-speed-gear, and the single chain-drive to the live-rear-axle. The car is built for use with solid tyres, and is of very substantial construction, having been designed to meet the requirements of those who want a reliable car of this type at a moderate price. It is, in fact, a good honest example of British workmanship and design.

Other British cars exhibited for the first time include the "Rothwell," which is of the live-axle type, and is fitted with a 10-12-h.p. twin-cylinder engine; the "Bell," which is made in three sizes, viz., 8-10-h.p., 16-20-h.p., and 24-30-h.p., of which the latter is of the chain-driven type, the other two having live axles; and the "Iden," which is of the live-axle type and is fitted with a four-cylinder engine. The Iden cars are made in two



AGRICULTURAL HALL SHOW.—The "Lipscombe" small car, constructed by the English Motor Car Company, is of the live-axle type, is fitted with a single-cylinder vertical engine, and has a gear-box of the sliding spur-wheel type, which gives three forward speeds and a reverse.

sizes, viz., 10-17-h.p. and 25-35-h.p., but are similar in design and both have four-cylinder engines. The clutch is perhaps their special feature, for it is of the metal-to-metal type and runs in oil. The metal face of the inner member is made in sections, and these are secured to a leather foundation which is attached to the clutch casting proper. The change-speed gear is of the ordinary sliding spur-wheel type, and the propeller-shaft is enclosed in a tubular casing which is supported, at its front end, by a ball-bearing on the propeller-shaft itself. A 4-cylinder British car, which has been placed on the market at a remarkably low price, is the "Leader," which was exhibited by the manufacturers, C. Binks

Limited. The car is of the live-axle type and has a sliding spur-wheel change-speed gear. Its appearance is rendered rather unusual because the steering-pillar passes through the dash and lies outside the bonnet in front.

Several of the larger Continental firms were represented, notably the De Dietrich (Burlington Carriage Company), Hotchkiss (London and Parisian Motor Company), Bruhot, Mors, Mercedes, Bugatti-Hermes (Burlington Carriage Company), Darracq, Prunel (Delamotte and Foster), Peugeot (Friswells, Limited), Delaunay Belleville, Richard-Brasier (Mann and Overton), Itala, Decauville, Metallurgique, Pivot, Leon Bollée, Hautier, Spyker (Automobile and Commercial Syndicate), Rochet-Schneider, and La Locomotrice (Donne and Williams). The models exhibited, however, have been, for the most part, on view before, and are already well known to our readers. Thérý's victorious Richard-Brasier car was shown by Mann and Overton.

(To be continued.)



AGRICULTURAL HALL SHOW.—The "Bayley" car, exhibited by the English Motor Car Company, is fitted with a live axle, which is worm driven, and with a "Sparkes-Boothby" hydraulic clutch. It has a 4-cylinder engine, and a gear-box of the sliding spur-wheel type.

SPEED INDICATORS FOR AUTOMOBILES.—PART IV.

S. SMITH AND SONS' SPEED INDICATOR.

AMONG those indicators which are of the mechanical type, that made by the well-known firm of watchmakers—S. Smith and Sons—deserves particular consideration, both for its design—which embodies several interesting features—and its construction, which is of that finish naturally expected from a firm of such high standing. The indicator is actuated, in the usual way, by a flexible shaft, which is friction driven from one of the front road wheels of the car, and the indication of the speed is obtained from the movements of a centrifugal governor—driven by the flexible shaft—attached to a pointer which works over a circular dial, calibrated in miles per hour. In adopting this simple mechanical principle, the makers have realised that the effect of the centrifugal governor on the pointer is not directly proportional to the speed of the car, and that, unless special precautions are taken, the divisions on the dial will vary greatly in length for equal differences of speed. In order to neutralise this objection, three springs, instead of one, have been used in the governor, with the result that, as will be seen in our illustrations, the calibration of the dial is perfectly clear throughout its range, and is particularly distinct between 10 and 25 miles per hour, within which range the motorist will, in all probability, most frequently be travelling.

The instrument, complete with the flexible shaft, but without the friction gear drive, is seen in Fig. 1, and on either side of the

sleeve, C^5 , to be drawn longitudinally along the spindle; this action, however, is opposed by the force of three helical springs, C^1 , C^2 , C^3 . On one end of the governor spindle is a spur-pinion, C^6 , which meshes with a wheel, D^2 , fixed to the end of the flexible shaft, D .

The flexible shaft, D , is enclosed in a flexible tube, D^1 ; and is, at its lower end, attached to the friction gear by which it is driven from one of the front road wheels of the car. The motion of the vehicle is thus transmitted—through the shaft, D , and the gear wheels, D^2 and C^6 —to the governor spindle, C^4 . The governor spindle, C^4 , consequently rotates at a speed directly proportional to that of the car; provided that no slip takes place in the friction drive. The governor "balls," C , revolve with the spindle, C^4 ; and tend, owing to the action of centrifugal force, to fly outwards and so make the sleeve, C^5 , move along the spindle. This tendency is, as has been mentioned, opposed by the springs, C^1 , C^2 , C^3 , which are of varying strengths, C^1 being the weakest, and C^3 the strongest.

The reason for using springs of varying strength is, that the centrifugal force acting on the "balls" increases out of proportion to the speed of rotation, and is very powerful at high speeds. If only one spring were used, the sleeve, C^5 , would hardly move at all for slight variations at low speed unless that spring were in sufficiently strong to meet the requirements of fast running. By suitably proportioning the different springs, therefore, the actual travel of the sleeve, for equal differences of speed, can be regulated so that it may even—if desired—be greater at low than at high speeds, instead of *vice versa*. The springs are mounted upon separate sleeves in order that the range of their action may be limited, and so that they are no further compressed when the next stronger spring comes into play; in this way they are not unduly

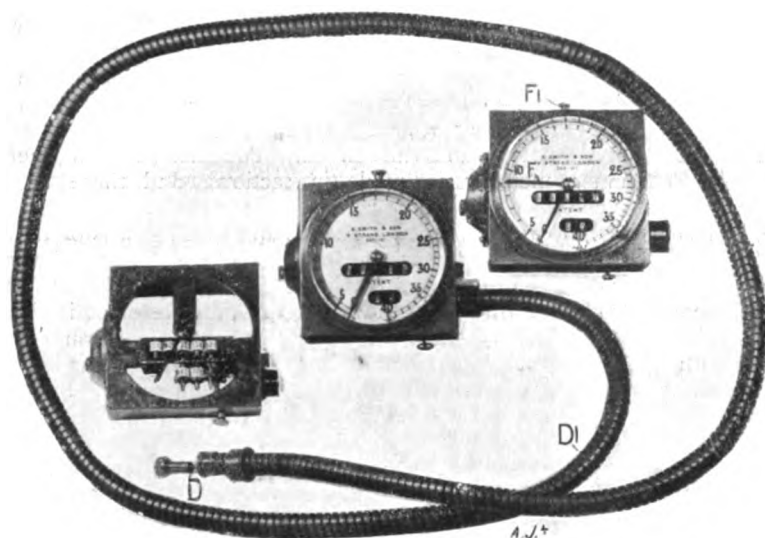


Fig. 11.—The Smith Speed Indicator. General view of the indicator with its flexible shaft, also separate views of the mechanism, and of the dial, showing the "maximum speed" recorder.

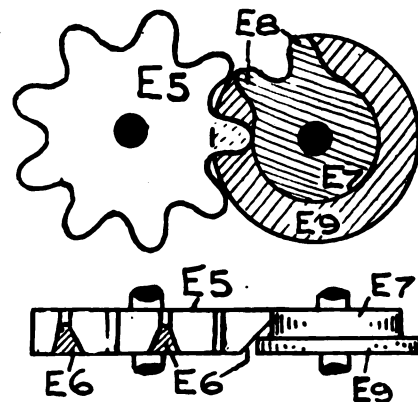


Fig. 13.—The Smith Speed Indicator. Diagram illustrating the action of the mileage recorder mechanism.

instrument proper is another view, that on the left showing the mechanism with the dial removed, and that on the right showing the action of a supplementary pointer, F , which indicates the maximum speed attained. This "maximum-speed" indicator is an attachment which is only fitted when required. It is a useful addition, however, and it loses nothing of its utility in that it can be instantly set to zero by pressing a button, F^1 , on the top of the case. In Fig. 2 are two views of the mechanism from behind, showing the arrangement of the governor and of the mileage recorder, which is another special feature of the "Smith" speed indicator. In the right-hand view of Fig. 2 the governor has been removed, but it is shown separately in the centre of the illustration.

The mechanism is contained in a neat brass case, A , the front of which is formed by the dial, the back by a detachable cover—not shown in the illustration—while, on one side, is a cap, A^1 , which forms a bearing plate for the governor spindle. The pointer, B , is attached to a spindle, B^1 , which is carried between the two brackets, A^2 and A^3 . On the rear end of the pointer spindle is a toothed pinion, B^2 , and just below this pinion is the hair spring, B^3 , which always tends to retain the pointer in its zero position. Lying horizontally in the case, A , is the governor which controls the indications of the pointer. The governor consists of three "balls," C , mounted on hinged arms which connect them to the spindle, C^4 , and to the sliding sleeve, C^5 , which rests upon the spindle, C^4 . The governor balls can be moved outwards radially, which causes the

strained, neither is their life impaired by excessive compression. The motion of the sleeve is transmitted to the pointer through the pinion, B^2 , a series of grooves being cut on the surface of the sleeve, C^5 , in order to enable it to engage with the teeth of the pinion, B^2 , at the same time that it revolves with the spindle, C^4 . In instruments fitted with the "maximum speed" indicator, the supplementary pointer, F (Fig. 1), is mounted on the spindle, B^1 , by which, however, it can be moved in one direction only. A small ratchet device is attached to this pointer, and holds it in the maximum position reached; but when the pointer is released—by pressing the button, F^1 —a spring comes into action and throws the pointer back again to coincide once more with the indicating needle proper.

The mileage recorder on the "Smith" speed indicator is a particularly neat piece of mechanism which is designed to show at a glance the total distance covered. It has a range of 10,000 miles, and indicates each $\frac{1}{10}$ of a mile, while a trip recorder, which can be set to zero when desired, is also added to this part of the instrument. The figures are marked on small drums, E , each of which is mounted on a separate spindle and is carried on the bracket, A^4 . The lower ends of these spindles are provided with toothed pinions and cam plates, which intermesh in such a way that each spindle causes the next to rotate one-tenth of a turn for each complete revolution. Instead of using intermeshing gear-wheels having a ratio of 10 to 1, a very neat arrangement is adopted which, besides

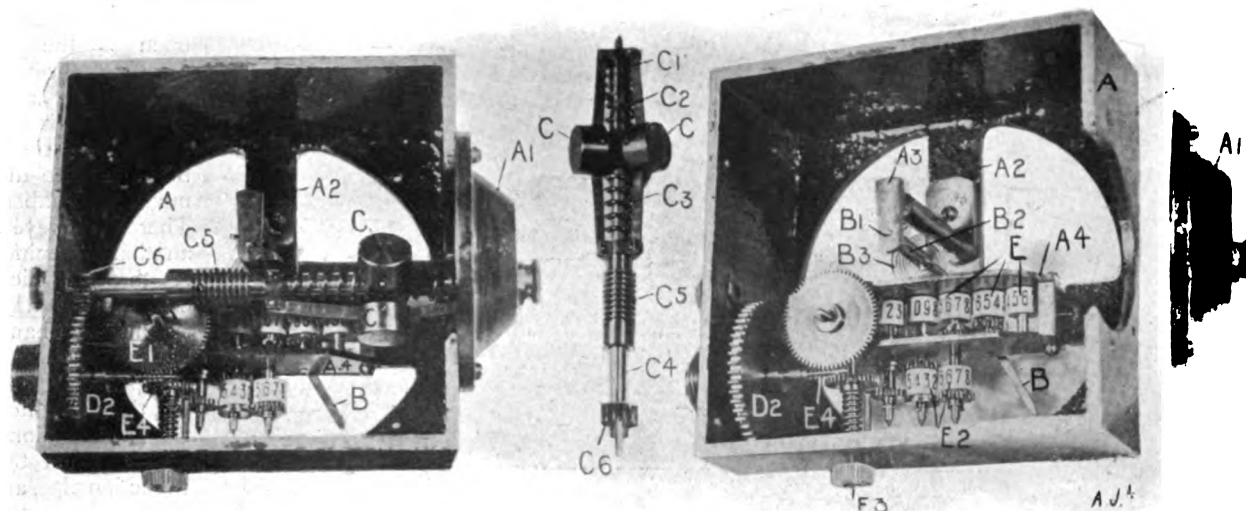


Fig. 12.—The Smith Speed Indicator. Views of the mechanism, taken from behind. The governor, C, has been removed in the right hand view, and is shown separately in the centre of the illustration.

giving greater compactness, has the fuller advantage of moving the drums one-tenth of a turn at a time, instead of slowly rotating them at a constant speed. A complete figure is then always in view on the face of the dial, and the change takes place quickly and decisively, so that two figures cannot appear at the aperture simultaneously, and no doubt can exist as to what the exact reading of the number should be. This intermittent action is obtained by causing a cam plate, E^7 (Fig. 3), to engage with the toothed pinion, E^5 , on the spindle of the next higher drum. The cam plate has, it will be noticed, two teeth, E^8 ; so that once in each revolution it will engage with the pinion, E^5 , and rotate it exactly one-tenth of a revolution. During the other nine-tenths of the time, the cam plate, E^7 , imparts no motion to the pinion, E^5 , and, to prevent the latter moving of its own accord during this period, a check plate, E^9 , is fixed below the cam plate, E^7 . This check plate, E^9 , is circular, except for a notch in its periphery between the two teeth, E^8 , and, in order that it may be able to hold the wheel, E^5 , every alternate tooth on that wheel is tapered off, as shown at E^6 . This allows the check-plate, E^9 , to lock the wheel, E^5 , stationary, and the notch in its periphery receives the alternate full tooth during such time as the cam-plate, E^7 , is in action. This mileage-recording mechanism is driven by the wheel, E^1 , which engages with a worm, D^2 , forming an extension of the spindle of the wheel, D^2 . The trip

recording drums, E^2 , are mounted below the drums, E , and they may be reset to zero, when desired, by means of the button, E^3 , which operates the pinion, E^4 . Normally the pinion, E^4 , is held idle by a spring, but it may be drawn into engagement with a pinion on the spindle that drives the trip recorder, whenever it is necessary to reset this part of the indicator.

Table of Reference Letters for S. Smith and Sons' Speed Indicator.

A	Case.	D ¹	Tube for D.
A ¹	Cap forming bearing plate for governor.	D ²	Spur-wheel driven by D.
A ² , A ³	Brackets carrying pointer.	D ³	Worm on spindle of D ² .
A ⁴	Bracket carrying mileage recorder.	E	Mi cage recording drums.
B	Pointer.	E ¹	Spur-wheel actuating E.
B ¹	Pointer spindle.	E ²	Trip recording drums.
B ²	Pinion on B ¹ .	E ³	Button for re-setting E ² .
B ³	Hair spring.	E ⁴	Spur-wheel operated by E ³ .
C	Centrifugal governor balls.	E ⁵	Toothed pinion.
C ¹ , C ² , C ³	Governor springs.	E ⁶	Tapered teeth on E ⁵ .
C ⁴	Governor spindle.	E ⁷	Cam-plate.
C ⁵	Governor sleeve.	E ⁸	Cam on E ⁷ .
C ⁶	Pinion on C ⁴ .	E ⁹	Check-plate.
D	Flexible shaft.	F ¹	"Maximum speed" pointer.
		F ²	Button for measuring F.

THE 1905 HOTCHKISS CARS.—PART III.

THE low-tension igniters, B, are carried by the inspection-covers over the inlet-valves. The magneto is gear-driven from the exhaust-valve cam-shaft, and the low-tension current is led to a neat terminal board, E^1 , which is clamped in an accessible position on one of the water-pipes and is provided with plug-switches. The wires from this board lead directly to the insulated "live" terminals, B^1 , which are so constructed that they resemble in appearance ordinary high-tension ignition-plugs. The rock-levers, B^2 , which form the "earthed" side of the igniter, are drawn into contact with the terminals, B^1 , by springs, B^4 , one spring being used for each pair of igniters, as seen in Fig. 5. Each of the rock-levers, B^2 , is operated by a special mechanism, carried by a small bracket, B^3 , which is bolted to the cylinder casting.

This mechanism—shown separately in Fig. 9—consists of a bracket, B^3 , an operating-rod, B^1 , and a striking-gear, B^6 , B^7 . The spring-controlled push-rod, B^4 , is operated from the inlet-valve cam-shaft, and its upper end is fitted with a hinged heel, B^5 , the position of which is ad-

justable. As the push-rod rises, the heel, B^5 , lifts the tappet, B^6 , which forms a bell-crank lever with the

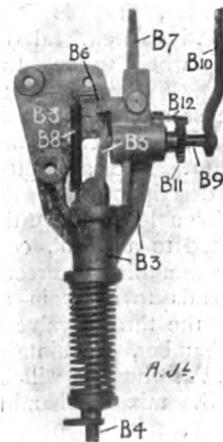


Fig. 9.—The Hotchkiss Tappet Mechanism for the low-tension igniters.

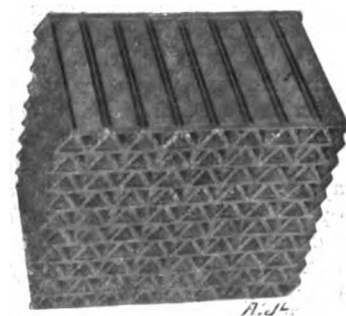


Fig. 8.—View showing a portion of the Hotchkiss Radiator, and the arrangement of the triangular tubs of which it is built up.

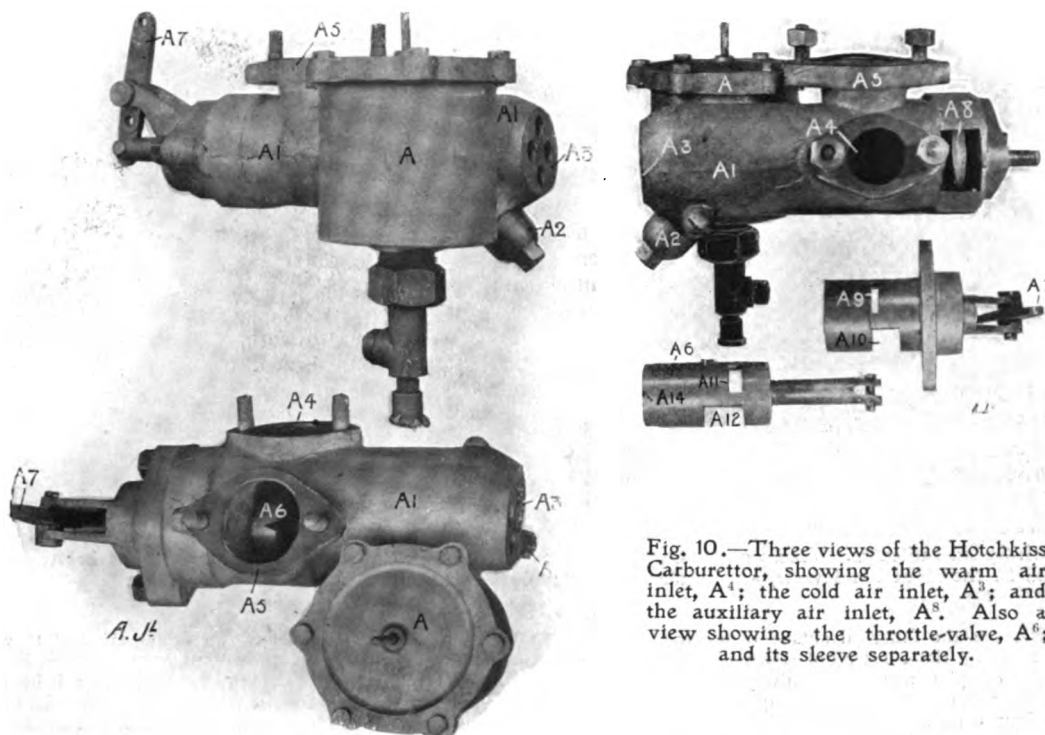


Fig. 10.—Three views of the Hotchkiss Carburettor, showing the warm air inlet, A⁴; the cold air inlet, A³; and the auxiliary air inlet, A⁵. Also a view showing the throttle-valve, A⁶; and its sleeve separately.

striking-arm, B⁷. The striking-arm, B⁷, is thus rocked over, and in moving away from the rock-lever, B² (Fig. 5), allows the low-tension igniter contacts to come together under the action of the spring, B¹⁴, which closes the electric circuit. When the push-rod has been raised to a certain height, however, the tappet, B⁶, slips off the heel, B⁵, and the spring, B⁷, causes the arm, B⁷, to strike the rock-lever, B², and so to suddenly separate the igniter contacts and produce a spark in the cylinder. The "timing" is very ingeniously effected by altering the position of the heel, B⁵, which is held against the end of a screw, B⁹, by the spring, B⁸. The screw, B⁹, is connected to the timing lever, B¹⁰, and this lever is operated by a bar, B¹³, connected to a hand-lever on the steering-wheel. When the screw, B⁹, is fed inwards, it so alters the position of the heel, B⁵, that the tappet, B⁶, is released earlier in the stroke, and the ignition is consequently advanced. A permanent adjustment is also provided by the toothed wheel, B¹¹, which is fixed to the sleeve in which the screw, B⁹, is carried, and the catch, B¹², normally engages with this wheel to lock it in the required position.

The carburettor, which can be seen in position in Fig. 5, is shown separately in Fig. 10, while a sectional line drawing is also given in Fig. 11. The carburettor has no automatic valve of any description, but the throttle-valve, which is actuated by a lever above the steering-wheel, and is also connected to a pedal, controls supplementary ports which communicate directly with the atmosphere, and this tends to maintain an approximately correct mixture as the throttle-valve is opened or closed. The float-feed-chamber, A, maintains a constant level of petrol in the jet, A², which, it will be noticed, is inclined obliquely in the mixing chamber casting, A¹. The warm air enters the mixing chamber casting at the fitting, A⁴, passes sideways down the passage, A¹³ (Fig. 11), returning over the jet, A², past the throttle-valve, A⁶, and so finds its way to the induction pipe fitting, A⁵. One end of the mixing chamber

is permanently open to the atmosphere through the holes, A³, and additional air can thus at all times be drawn into the mixing chamber. There is, however, another opening, A⁸, through which cold air can enter the mixing chamber casting, but the ports, A⁹ and A¹⁰, through which this air is alone able to reach the induction pipe, are controlled by the throttle-valve, A⁶. When the throttle-valve is closed, no auxiliary air is admitted to the mixing-chamber, but, as the throttle is gradually opened, the ports,

A¹¹ and A¹², come opposite to those, A⁹ and A¹⁰, in the mixing-chamber casting, and auxiliary air is then admitted to the mixing-chamber. These auxiliary air-ports are three in number, but they are not all the same size, their relative positions, however, can be seen in Fig. 10, where the throttle-valve, A⁶, and the sleeve—containing the ports, A⁹ and A¹⁰—which forms a guide for it, are shown separately, beneath a side view of the carburettor in

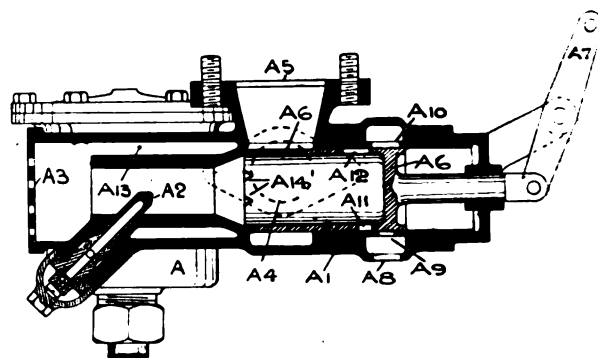


Fig. 11.—Sectional elevation through the mixing-chamber of the Hotchkiss Carburettor showing the passage, A¹³, by which the warm air reaches the jet, A², on its way to the induction pipe fitting, A⁵. The warm air enters at A⁴, cold air enters at A³, and auxiliary cold air is allowed to pass straight to the induction-pipe—when the [throttle-valve is open—through the port, A⁸.

which the opening, A⁸, in the casting is visible. The inner edge of the throttle-valve is, it will be noticed, cut with a series of notches, so that even when it is quite down on its seat there is still just sufficient opening to enable the engine to run slowly while the car is standing or the clutch is disengaged.

(To be concluded.)

THE NEW 35-H.P. BROOKE CAR.

(Continued from p. 382.)

INDEX

The Ignition-Gear.

THE position of the low-tension igniters, A, above the inlet-valves—so that they act as inspection-covers for those valves—is best seen in Figs. 5 and 6, although they are also visible in Figs. 1, 2, and 4. The igniters in themselves—and one of them is shown separately in Fig. 7—are of much the usual construction, with one stationary insulated terminal, and an uninsulated rocking-

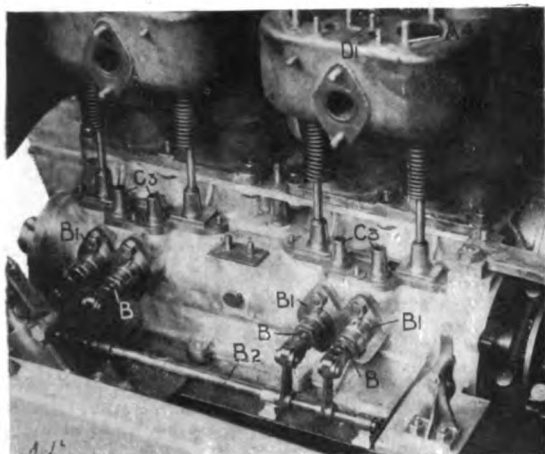


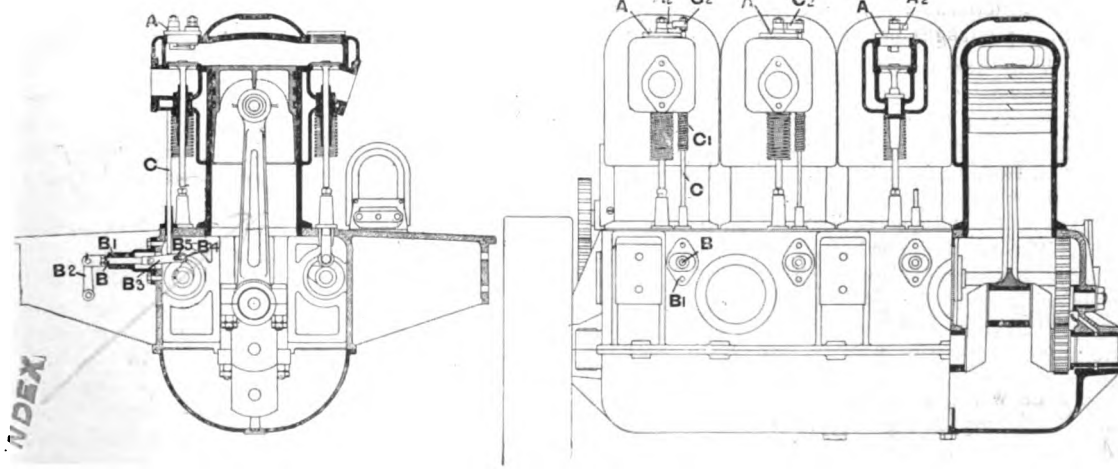
Fig. 7.—The Brooke Low-tension Ignition Gear. View showing a portion of the 15-20-h.p. engine, to which it is applied, and separate views of an igniter, an operating rod, and a lever forming part of the "timing mechanism."

member, but the method adopted for operating them is novel. This mechanism is indicated in Figs 5 and 6, and is very clearly shown by photographs in Fig. 7. The latter illustration shows a portion of a 15-20-h.p. engine (which, so far as the ignition-gear is concerned, is similarly equipped), with one of the igniters and the chief portions of the actuating gear (photographed separately) alongside it; the engine itself has its igniter, and their push-rods, removed in our illustration.

Referring to these illustrations, it will be seen that there are rods, B, passing through guides, B¹, in the side of the crank-chamber, and that these rods can be simultaneously slid inwards or outwards, for "timing" the ignition, by rocking the external-shaft, B². The rods, B, have, pivoted to their inner ends, small levers, B³, each of which carries a roller, B⁴, that rides on the ignition-cams on the cam-shaft. The levers, B³, are caused to rock about their fulcrum-pins by the cams, and they, in turn, impart the action of the cams to the vertical push-rods, C, which pass upwards through the guides, C¹, in the top of the crank-chamber. The push-rods, C, are normally held down upon the levers, B³, by springs, C², and they pass through holes drilled in the cylinder-castings, so that their upper ends project alongside the igniters, A. The shape of the ignition-cams is—as seen in Fig. 5—such that the levers, B³, and, therefore, the rods, C, are raised gradually, but are allowed to descend suddenly, the result being—as will be made clear presently—that a slow "make" and a very quick "break" are ensured for the igniters. Before explaining, however, the action of the vertical rods, C, on the igniters, it should be pointed out that the time of ignition varies when the sliding rods, B, are moved inward or outward, because the projecting portions of the cams then come into contact with, and release, the rollers, B⁴, later or earlier in the cycle of operations. By sliding the rods inwards, the ignition is, therefore, "retarded," and,

conversely, by sliding them outwards, it is "advanced." Owing to the shape of the cams, there would be a risk of their damaging the levers, B³, and the other portions of the ignition-gear, if the engine were for any reason to run even a turn or so backwards, and so, in order to provide for this contingency, the rollers, B⁴, are carried in horizontal slots in the levers, B³, and there are springs, B⁵, to allow them to be forced backwards out of the way.

(To be continued)



Figs. 5 and 6.—Transverse cross-section, and side elevation (part sectional), of the 35-h.p. Brooke Engine, showing the mechanism for operating the low-tension igniters.

THE THORNYCROFT LURRIES, OMNIBUSES, AND VANS.—PART III.

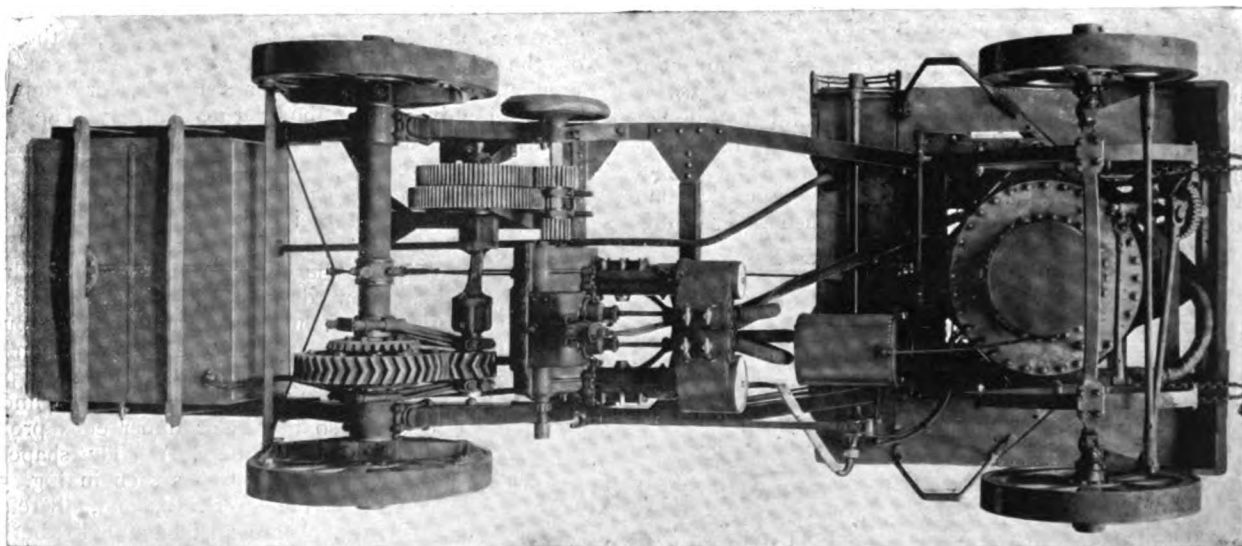


Fig. 4.—View from beneath of the 4-ton Thornycroft Steam Wagon, which has a water-tube boiler, a 30-h.p. engine, and "Ackermann" steering.

THE 5-ton lurry is in general respects similar to the earlier 4-ton wagon, but is strengthened throughout to enable it to carry the increased load, and the engine is capable of giving about 50-h.p. In addition to carrying 5 tons on its own platform, it is intended to draw 2 or 3 tons more on a trailer. The standard platform area is 13 ft. 6 in. long by anything up to 7 ft. wide, and the wheel-base and track of the vehicle are 11 ft. 5 in. and 5 ft. 7½ in., respectively.

The main-frame, which is constructed of channel steel, is mounted on semi-elliptic side-springs, as on the 4-ton vehicle, and the front axle carries the steering-wheels, with steering-heads at each end on the "Ackermann" system, while, as before, the company's special "spring-drive" device is introduced between the live-axle and the road-wheels. By placing the boiler* in the position shown in Fig. 2, the door of the smoke-box projects through the "cab" casing in front, and thus the tubes are all readily accessible for cleaning.

The engine, which is of the horizontal, compound, reversing type, as before, is considerably larger than that on the 4-ton model, and, instead of having piston-valves, is provided with those of the flat type. The bore of the two cylinders is 4½ in. and 7 in., respectively, by a 7 in. stroke—instead of 4 in. and 7 in. by 5 in.—and the flat valves have relieving saddles to reduce friction. The moving parts of the engine are enclosed in an oil-tight casing, in which they are lubricated on the splash principle but are easily accessible for inspection and adjustment. The engine is connected through a two-speed gear, a short universally-jointed shaft, and a pair of spur-wheels, with the differential-gear on the back axle. The transmission-gear is, in fact, arranged in very much the same way as formerly, though it has been modified and improved in certain respects. We noticed, for instance, that the larger of the two sliding spur-wheels, on the crank-shaft, now surrounds the smaller sliding-wheel, when the former is in mesh, the space occupied by these

wheels on the shaft being thereby considerably reduced. The water tank, at the back of the frame, has a sufficient capacity for running a distance of from 15 to 18 miles without replenishing, and the bunkers hold enough coke for about 45 miles. The wheels are usually steel-castings—as seen in Fig. 2—and there is a powerful screw-down brake that acts on a drum on the back-axle. It will also be noticed that a canopy is arranged to protect the driver from the weather.

The Thornycroft Spring Drive.

Although the special device employed by the Thornycroft Company on most of their heavy commercial vehicles, whether propelled by steam or petrol engines, has been fully described by us in the past, yet, for the benefit of those unacquainted with it, we give illustrations showing its construction in Fig. 5.

(To be continued.)

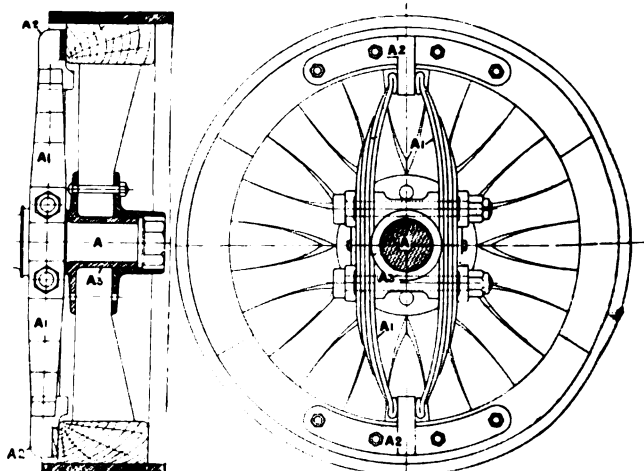


Fig. 5.—Cross section and side elevation of the Thornycroft "Spring Drive."

* By an error the heating surface, which is 57 sq. ft., was given as 75 sq. ft. by us last week. (Tech. Ed.).

THE WOLSELEY INDUSTRIAL VEHICLES.

(Continued from p. 385.)

The Standard Omnibuses.

THE 'buses now being manufactured include those of the single-deck and of the double-deck types, for both of which there is already such a great demand in town and country districts. The 22-seated single-decker, of which an illustration accompanies this article, has been particularly designed for country services, where it is frequently necessary to carry a considerable amount of heavy personal luggage, where many passengers often prefer to ride outside, and where double-deckers are unsuitable, besides being often precluded owing to the limited head room in places along the route. The driver's seat is placed well forward—rendered possible owing to the absence of any bonnet—and is wide enough to accommodate two passengers as well, while there is a second outside seat for four people behind him, and the interior of the 'bus has seats for 16 people. The vehicle thus carries 22 passengers, and yet it is not inconveniently long for travelling even in heavy traffic. There is ample room upon the roof, which extends forward above those sitting in front, to carry a considerable amount of luggage. The roof is strong enough for this purpose, and there is a ladder permanently fixed to the "off" side of the vehicle, near the front seat, by which it can be reached. The double-decker, which more closely resembles in outward appear-

ability has been specially aimed at, while ample power has been rendered available in order to enable a good average speed to be maintained even in hilly districts. The smaller engine is capable of giving about 26-b.h.p. on the test bench, and the larger engine gives about 28-b.h.p.

Referring to our illustrations, it will be seen that the main-frame is constructed of pressed steel, and that the side-members have a tapering channel section. The available length behind the dash is 16 ft. 6 ins., and the top of the frame is 31 inches above the ground, while the maximum depth of the side-members is 7 ins. The frame is thus one of the largest of the type that has as yet been made, and ensures ample strength combined with lightness. It is carried on semi-elliptic side-springs above both axles, with those at the back carried at each end in shoes outside, instead of beneath. The springs are all sufficiently long to ensure comfort, and to protect the

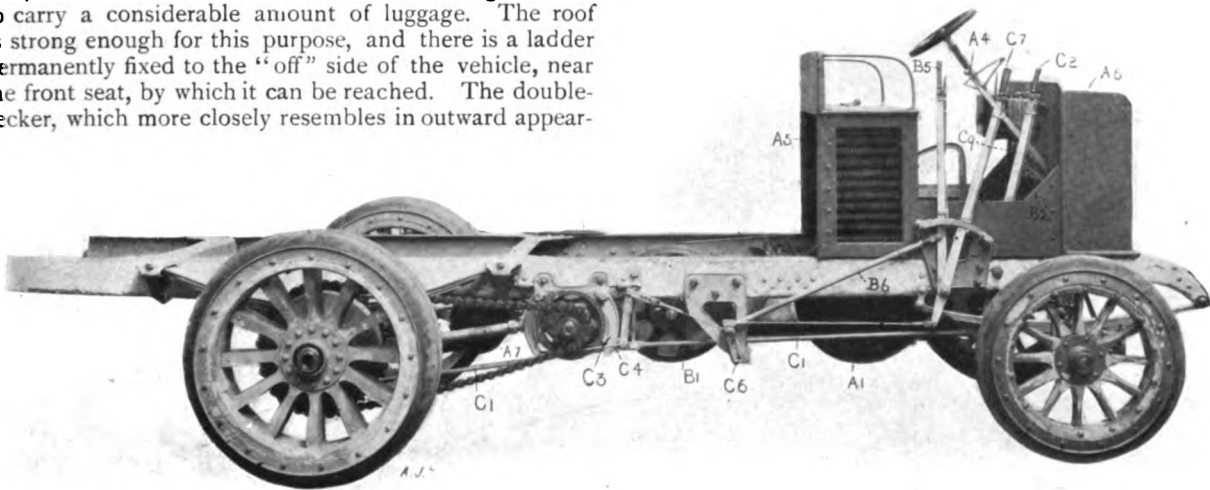


Fig. 1.—Side View of the Wolseley Omnibus Chassis, fitted with the twin-cylinder 20-h.p. Petrol Engine.

ance those 'buses which are already in use in London and other large towns, has a total seating capacity for 34 passengers, although, for the reason already mentioned in connection with the single-deck model, the overall length is comparatively small.

The standard chassis is shown from the "off" side in Fig. 1, and from above in Fig. 2, these two illustrations, taken in conjunction with one another, enabling the general arrangement of all parts to be clearly seen. The same chassis is either fitted with a 20-h.p. twin-cylinder engine—with which it is shown in these illustrations—or with a 24-h.p. 4-cylinder engine that can be substituted for it in the same frame. Whichever engine is used, the cylinders are all placed horizontally in line with one another, and project forward from the crank-chamber. The 20-h.p. engine has cylinders of 6 ins. bore, by 7 ins. stroke, and the normal speed is 600 revs. per min.; the 24-h.p. engine has cylinders of 4½ ins. bore, by 6 ins. stroke, and its normal speed is 750 revs. per min. In both cases, therefore, it will be seen that the engine-speed is kept low, and that long life coupled with great reli-

chassis from undue vibration, while, in order to absorb all sudden shocks when starting from rest, or when travelling over exceptionally rough road surfaces, short coiled springs are introduced between the radius-rods and the back axle. Otherwise, the radius-rods are arranged in the ordinary manner, between the axle and the frame, and are provided with the necessary adjustments for keeping the side-chains sufficiently tight.

The back axle is made of weldless steel tube, which has been found so particularly satisfactory for road vehicles carrying heavy weights, and the front axle is a solid forging of much the same design as that employed on the Wolseley pleasure vehicles—the bifurcated ends form the top and bottom supports for the steering-heads. All four wheels are of the 'artillery type, and are shod with solid rubber tyres; the front wheels have single tyres 34 ins. in diameter, and the back wheels have 42-in. twin tyres. The wheel-base is 12 ft., the track 6 ft. 2 ins., and the overall width conforms with the regulation 7 ft. 2 ins. limit.

(To be continued.)

THE LATEST CLARKSON STEAM 'BUSES.

(Continued from page 386.)

ALTHOUGH in the following description the construction, arrangement, and functions of all the chief parts of the single-deck 'bus chassis will be dealt with, yet we would refer our readers to previous articles that have appeared in our columns respecting it in its earlier form, for they are accompanied by many illustrations which will be found useful, and—further than this—it is our intention now to refer more especially to such improvements as have been made comparatively recently. In November, 1902 (8th, 15th, and 22nd), the entire system was dealt with, with a very complete set of illustrations. On February 21st, 1905, the lubricating system and the burner were referred to, in conjunction with photographic reproductions, and on December 26th, of the same year, the automatic burner, regulator, and automatic feed-water device were described, with the assistance of sectional drawings.

Our present illustrations of the chassis include a view taken from the "off" side, in Fig. 1, another taken from above in Fig. 2, and a third showing the central and front portion in Fig. 3. From these, it will be seen that

From the illustrations, it will also be seen that the engine and the differential countershaft together form a single unit which lies horizontally beneath the floor level, and is fixed in place with a three-point suspension that renders it capable of "floating" in relationship to the main frame itself. The two cylinders, A, which are double-acting, and both of which receive high-pressure steam, project forward from the crank-chamber, B. The cylinders and the crank-chamber together constitute the entire engine proper, which can be removed intact from the countershaft casing, C. The crank-chamber, B, not only has a large detachable lid for inspection, but all four sides have large doors, which can be easily removed, while a further special feature is that the aluminium casting, B, is in reality only an oil-tight casing formed around the engine, and is not—from a mechanical point of view—relied upon to take any of the strains of the moving parts. The casing enclosing the differential gear and its countershaft is formed by two aluminium castings, C, which together enclose it completely from one end to the other, so that all the moving parts are submerged in a bath of oil.

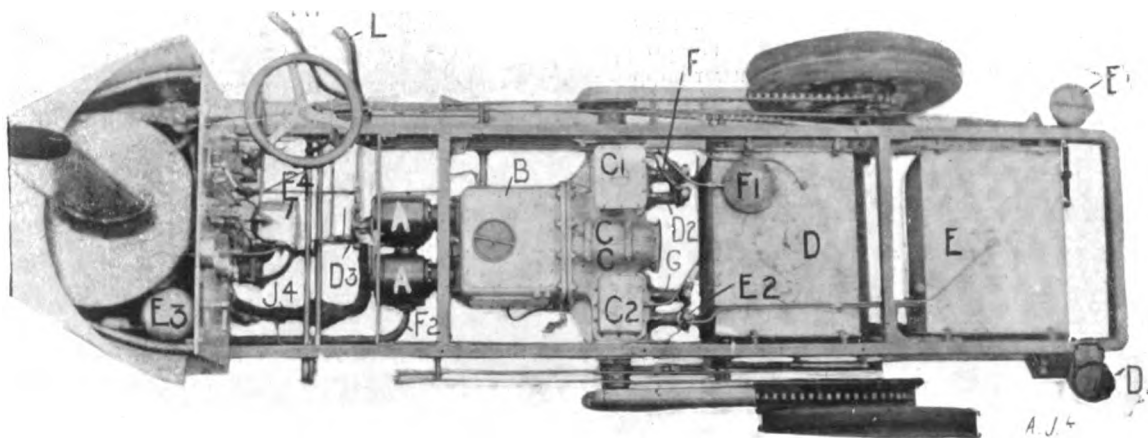


Fig. 2.—View of the Clarkson Single-Deck 'Bus Chassis, from above.

the boiler is fixed in the front of the channel steel frame, and that it has an oval-shaped funnel projecting upwards, in such a way as not to obscure the view from the driver's seat. The boiler lies immediately in front of the dashboard—between it and the condenser, F³—and there is a sheet metal casing that constitutes a kind of bonnet around it, with doors in the casing for getting at the boiler fittings and other parts. The main frame is carried on semi-elliptic springs above both axles, and there are small grease cups fitted to each of the shackle pins. Both axles are substantial steel forgings, which provide large plain bearings, at their extreme ends, for the artillery road wheels to run on. The wheels are usually shod with solid rubber tyres, and, for 'bus work, the driving wheels have twin tyres. Of the steering gear, it is unnecessary to more than state that it is arranged in much the usual way, and is rendered practically irreversible by a worm-and-sector gearing, that is enclosed in an oil-tight casing at the base of the steering pillar. Between the back axle and the main-frame, the usual adjustable radius rods are provided, being rendered adjustable for tightening the side chains; these radius rods at their front ends ride about the axis of the differential countershaft.

The countershaft not only serves the usual purpose of driving the rear wheels through the side chains, but is employed for driving all the feed-pumps, and also for actuating the special lubricating mechanisms which play such an important part on the Clarkson cars. In Fig. 2 it will be seen that there are four of these pumps, and that they are placed horizontally—projecting rearwardly from the casing. The pump, F, returns the condensed water to the supply tank, the pump, D², feeds the boiler with water, the pump, G, lubricates the entire mechanism, and the pump, E³, feeds the fuel to the burner.

The differential countershaft lies immediately behind the crank-shaft of the engine, and is driven from it by a pair of large spur-wheels. It is now mounted in long plain bearings, instead of in ball-bearings, as before, and—like the crank-shaft and several other parts of the engine—is made of nickel steel.

At the back of the frame are fixed the water-tank, D, and the fuel-tank, E, the former being just in front, and the latter behind, the axle. Both have large fillers, D¹ and E¹, brought well outside at the back of the frame, so as to be accessible without disturbing the passengers.

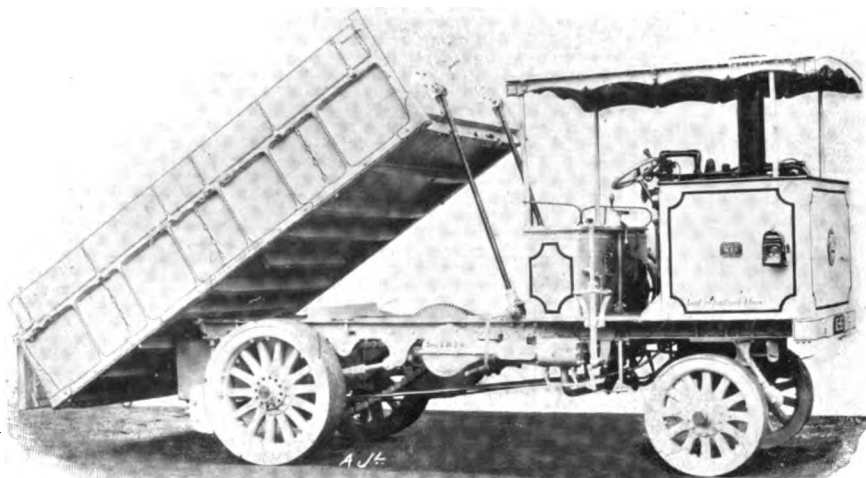
(To be continued.)

THE BRISTOL WAGON COMPANY'S 5-TON LURRY.

THE 5-ton luries built by the Bristol Wagon and Carriage Works Company, one of which was on view at the Agricultural Hall Show last week, are, as will be seen from our illustration, of a type in which the back axle is driven by one large chain. The body, which has a platform area of 12 ft. 6 ins. by 5 ft. 6 ins., is mounted so that it can be tipped up for shooting off the load, and is fitted above the channel steel frame that carries the driving mechanism. The frame is mounted on semi-elliptic springs above the back axle, but is carried by a central turntable, and by transverse springs, in front, steering being effected by moving the front axle round about its pivot, by means of an enclosed worm gearing. The wheels are built up with oak spokes and ash felloes, upon steel hubs, but those at the rear—which are 3 ft. 4 ins. in diameter and have 7-in. iron tyres—have additional steel forgings fitted between the axle and the felloes, so that the drive is taken direct to the tyres and no driving strain is imposed on the spokes. In front, the wheels are 2 ft. 6 ins. in diameter and have 5-in. tyres.

The boiler, which is fixed in front, beneath a wooden canopy that shelters the driver, is of the vertical fire-tube type, and is provided with the usual fittings, including an injector. The 2-cylinder horizontal compound engine is fixed beneath the frame, with its cylinders lying underneath the side members, so as to be accessible. The bore of the two cylinders is $4\frac{1}{2}$ ins. and 7 ins. respectively, and the stroke of both is 7 ins. ;

arrangements are made whereby high-pressure steam can be admitted to the low-pressure cylinders if required. All the moving parts are enclosed in dust-proof casings, and there is a two-speed gear-mechanism of the usual sliding spur-wheel type, between the crank-shaft and the countershaft—from which the twin chain is led to the back axle. This gear can be operated from the driver's seat, without stopping the vehicle, and it has steel



View of the 5-ton Tip-Wagon built by the Bristol Wagon and Carriage Works Co.

pinions that mesh with gunmetal spur-wheels. Connected with the crank-shaft, is the feed-water pump, which takes its supply from the tank beneath the frame at the rear, and delivers it into the boiler. The water tank has a capacity of 145 galls. and is fitted with a water lifter.



THE NEW WOLSELEY CARBURETTOR.

WE are now able to give some further illustrations (Fig. 10), showing the construction of the combined carburettor and throttle-valve which is now being employed on all the latest Wolseley cars, and is so designed that an approximately constant richness of mixture is maintained in practice. In our issue of February 25th last, on page 254*, we gave an illustration in which this same apparatus was shown from photographs. On the present occasion the same reference letters have, for convenience, been used for the same parts.

In Fig. 10, this combined apparatus is shown in elevation (part sectional), and also in plan, with the induction-pipe fitting, C², bolted in place to it. The mixing-chamber casting, C¹, is arranged in conjunction with a float-feed chamber, in the usual way, and the whole of the air that enters the mixing-chamber is

drawn through the silencing air-bottle, C⁴. Immediately above the spray jet, is fitted the throttle-valve, and this valve not only controls the passage of the explosive mixture from the mixing-chamber to the induction-pipe, C², but is also able to restrict the free passage of the air to the mixing-chamber proper. For this purpose, and in order to render the spray jet easily accessible—by removing the entire throttle valve—that valve is formed by three sleeves, as seen. The sleeve, C³, which is provided with a flange at its upper end, is bolted down in place so that it surrounds the jet, and it forms a guide for the sliding sleeve, C¹, that lies inside it, while the other sleeve, C¹, is held stationary by the same bolts that secure the sleeve, C³, in place, and it constitutes a guide for the rod that is fixed to the sleeve, C¹, and for the piston, C⁵, that forms a part of that rod.

The stationary sleeve, C³, has square ports cut through its wall, opposite to the induction-pipe, and the inner sliding sleeve, C¹, has curiously shaped ports to correspond with them, while the lower end of the sleeve, C⁴,

* We regret that an error was made in the explanation then given of the action of the apparatus; the above description should be substituted for it.—TECH. ED.

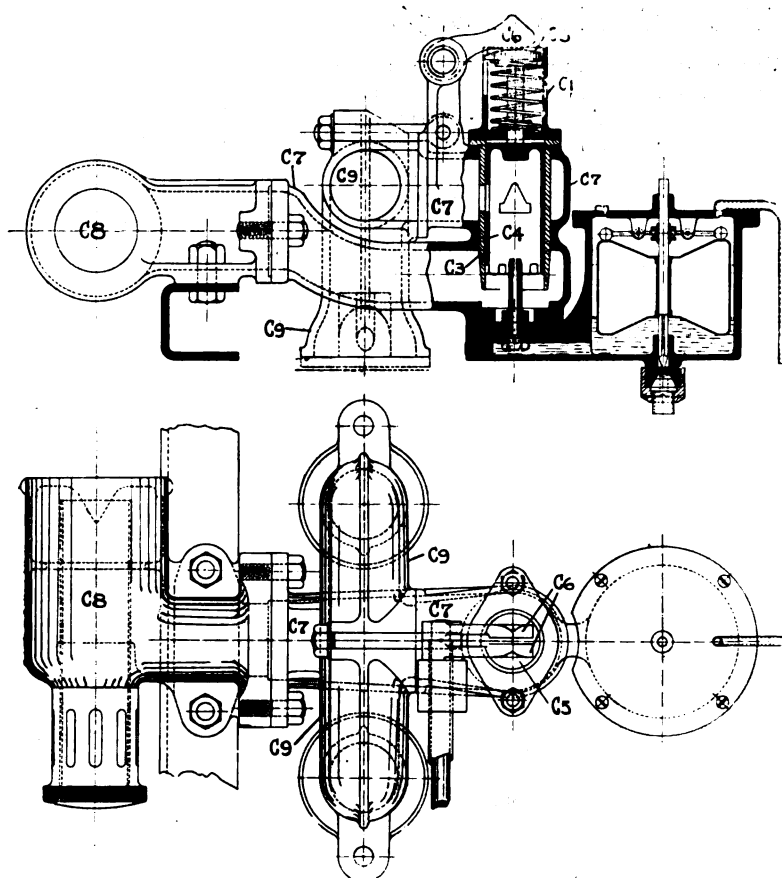


Fig. 10.—Side view (partly in section), and plan of the Wolseley combined carburettor and throttle-valve, as fitted to the makers' new 8-h.p. and other vehicles.

has small slots that allow a small quantity of air to reach the spray-jet, even when the throttle-valve is practically closed. The throttle-valve is normally held open by the spring that is fitted beneath the piston, C^5 , inside the sleeve, C^1 , and there are two pivoted lever arms, C^6 , either of which can be made to close it to the required extent, a slot being cut in the sleeve, C^1 , for this purpose.

One of the lever arms, C^6 , is controlled by one of the hand-levers on the steering-pillar of the car, and the other is connected with the brake-pedal; the valve can always be closed to a greater extent by either, but can only be opened wider if allowed to do so by both.

When the throttle-valve is fully open—as seen in Fig. 10—the sleeve, C^1 , does not interfere with the free passage of the air to the spray-jet, but after the valve has been closed to a certain extent, the sleeve begins to project down beyond the stationary sleeve, C^3 , and consequently reduces the size of the annular space around the bottom of the jet. In this way, the suction exerted on the spray-jet is maintained instead of being allowed to decrease, as it otherwise would be, and thus the richness of the mixture is prevented from diminishing unduly, as it would do if the jet remained in open communication with the air-bottle, C^8 . When the throttle-valve is almost closed, the air can only find its way into the mixing chamber through the slots that are cut in the lower end of the sleeve, C^1 , and the slots are of such size in relationship to the ports of the throttle-valve proper, that the necessary degree of vacuum is at all times maintained in the mixing-chamber to ensure the required rate of flow of the petrol for carburetting the air that the engine is then taking.

It will be realised that the precise proportions of the various parts, and the exact shapes of the ports, have been arrived at by careful experiment, and that, by the adoption of this device, there is no need for any additional hand-control for regulating the carburettor while the engine is running. An adjustable valve is, however, fitted to the air-bottle, C^8 , by which the size of the inlet passages can be varied, but this is, in reality, only a permanent adjustment, though it may, at times, be found convenient, in order to compensate for different climates, or for other grades of petrol.



THE Anglo-American Oil Company are issuing to motorists a very handy set of road maps enclosed in a handsome leather pocket-book case, with a pocket specially assigned for the licence which every wise motorist always carries about him when "on the road." The principle on which the maps are arranged makes reference exceedingly easy, and is, as far as we are aware, novel. Each little volume of maps commences with three general key maps, by means of which the special large scale map (relatively speaking) for any district can readily be discovered. These maps, which contain the main roads and heights indicated by a special colour scheme, are accompanied by profiles of the main roads. The heights of districts and places can be ascertained at a glance, both on the maps and the profiles, as three colours are adopted, for levels under 100 ft. up to 200 ft., and above 500 ft. The maps are small scale, and indicate only main roads. They are

specially designed, therefore, for motorists who travel considerable distances, and are not intended to replace large scale maps for local use.

ALL the people who desire to travel between Brondesbury and the Strand should be delighted at the new service of six motor omnibuses put on by the London Motor Omnibus Company. Not only have the motor omnibuses reduced the cost of travelling between the two points, but needless to say they travel in a vastly shorter time, and traverse an entirely new route, *via* Portland Road and Baker Street. The company has adopted the sensible method of giving each particular line of 'buses a distinctive name, this new line being very appropriately termed the "Vanguard." The full hundred motor 'buses which the company will shortly have upon the streets are now being delivered by the Milnes-Daimler Company at the rate of five per week.

REVIEWS OF BOOKS.

"Petrol Motors and Motor Cars" A Handbook for Engineers, Designers and Draughtsmen.

By J. HYLER WHITE, A.M.I.M.E.
(Longmans, Green, and Co., London.)

MR. J. HYLER WHITE, in the present volume, has contributed another of the many treatises on automatic locomotion which the motor car movement is calling forth with ever-increasing frequency. Perhaps the title is somewhat misleading, as the book does not deal with specific motor cars, but rather with the various parts and appliances which go to make up an automobile. The general principles of petrol motor construction are discussed, though no illustrations of representative machines are given, those supplied being more or less what the Germans call "caught out of the air." Considering the large number of standard vehicles in existence it would, perhaps, have been more interesting to use some of them as actual illustrations. The general principles of electric ignition, transmission, and gearing are dealt with, and as the subject is a large one—including practically all the elements of motor car design—when we say that it is dismissed in 125 8vo. pages, it is obvious that the treatment in general is far from exhaustive. The information given, however, is just of that kind which is required by the draughtsman or designer of cars, though unfortunately it is not uniformly up-to-date, and, in some respects, would, for this reason, prove misleading to the less experienced man. As an attempt to perform an extremely difficult task, the book will doubtless prove useful to the more technical of our readers, but it will be found to bring home the fact that it is almost impossible for any individual engineer to keep thoroughly *au fait* with automobile progress nowadays, and to find time to write books as well. The work to some extent suffers from appendicitis. It is the disease of the oyster which produces the pearl, and perhaps the most useful part of Mr. Hyler White's book to a practical man consists of the appendices, which give in a handy and concise form a large collection of those tables which apply specially to automobile design. The tables include areas of circles, standard screw threads, degrees of density for liquids, gear data, and other valuable "pocket-book" information.

Motors and Motoring.

By PROF. H. C. SPOONER.
(London: T. C. and E. C. Jack. Price 1s.)

THIS is the most recent number of this really wonderful series of shilling scientific text books. At least the series must be wonderful, if as much value is given in the other cases for a shilling as in the present instance, for this handy little volume covers almost the whole ground of motors and motoring—of course, necessarily with large omissions, considering it only consists of about 100 pages. But the wonder is, not what has been omitted, but the amount has been got in, and a beginner who wants a general outline of the subject in short compass and clearly written, cannot do better than become the purchaser. He must, of course, remember that the danger of the condensed scientific shilling primer is that the beginner, having read it, thinks he knows all about the subject, whereas the true function of the primer, and this one is evidently designed for that purpose, is to give a general survey of the territory.

We suppose it is characteristic of the series, but we

admit it is rather irritating that while a list of illustrations is given there is no table of contents, but there is a good alphabetical index. Perhaps a certain amount of hurry may excuse some *naïveté* of expression, as when the author says of road-wheels that "these are made of either oak or metal, the former known as artillery wheels." But such things are trifling matters and do not detract from the general usefulness of the little volume. We hope the future will justify the optimistic opinion expressed on several pages of the Macalpine process for refining oils, of which the author appears to hold a high opinion.

Automobil-Kritik.

By MAX R. ZEHLIN.
(Berlin: Mitteleuropäischen-Motorenwagen-Verein.)

THE author, as we learn, is a "sworn" expert in automobile matters, and the work in question accordingly deals with automobile construction from the point of view of what is ideally right and proper in construction from the expert point of view. In fact, all the principal parts of the automobile are treated separately, and the considerations which should weigh with the engineer in designing them are considered in a succinct and practical manner. The work is clearly written, and should prove a useful work of reference to the German automobile engineers and manufacturers, and, in fact, to any engineer who understands German.

The Inventor's Guide to Patent Law and the New Practice.

By JAMES ROBERTS, M.A.
(London: John Murray. 2s. 6d. net.)

THIS is a valuable little handbook for anyone who wishes a compact guide into the mysteries of patent law and practice. In fact, it is wonderfully successful in presenting in short compass all that the inventor, who desires to be his own patent agent, need know, at any rate for a commencement. It is, of course, not a work on the same scale and scope as the same author's large treatise which we reviewed just a year ago, but it will form both a valuable guide and supplement to it.

How to Take Out Patents in England and Abroad.

By E. and A. E. EDWARDS.
(London: Wyman and Sons, Limited. 2s.)

THIS is even a shorter treatise on a big subject than the preceding, and is not nearly so compendious, though it should be useful to those just commencing to study the subject. It has a careful *résumé*, however, of foreign patent law, brought up to date, and this part of the little work forms a helpful work of reference.

PUBLICATIONS RECEIVED.

Pratt's Pocket Book and Motor Atlas of Northern England, South-Western England, and South-Eastern England. London: The Anglo-American Oil Company, Limited.

Dicks' London Street Guide. London: John Dicks. Price 1d.

Catalogues.

Automobiles Peugeot, 1905. Friswell, Ltd., 1, Albany St., N.W.
The London Autocar Company, Limited, April, 1905. 182, Gray's Inn Road, W.C. Price 3d.

Horblicks, 1905. Manchester: Horsfall and Bickham, Pendleton.

Ignition Accumulators and Automobile Accessories, 1905-6. Messrs. Peto and Radford, 55, Hatton Garden, E.C.

CORRESPONDENCE.

"The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries."

Re THE SHOW QUESTION.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—As the bond and papers in connection with the Show of the Society of Motor Manufacturers and Traders at Olympia have just come to hand, I feel that the right moment has arrived for the trade to seriously consider the position before signing the bond, and agreeing to the only show of the year being held in November.

As I think both Mr. Jarrott and myself were among the first individuals to sign the bond, I have a right to speak. At that time the trade was absolutely divided as to the right place to show, and had it not been for the bond I believe there would have been a very poor representative show of motor manufacturers and agents. Now I feel that it has accomplished its purpose, having done the work for which it was originated, and could be very well dispensed with. The recent Show at Olympia in February has shown the trade and the public that there is no question but that the Society's Show is an assured success, because of the number of firms in the business who will always show where the largest manufacturers are showing. It seems to me an act of weakness now on the part of the Society to ask the manufacturers and agents to sign the bond, undertaking to show at no other exhibition within twenty miles of Charing Cross. My opinion is that applications for space will be sufficient to fill Olympia in November at the next Society's Exhibition, and the manufacturers have decided—rightly or wrongly—that the date of the next year's Exhibition is to be November. This is a very bold step to take, and time alone will show whether it is the right date or not. I think everyone will agree that the recent Exhibition held at Olympia in February was the most successful automobile exhibition ever held in this country from every point of view, and more than successful on the main point, viz., business done. We have proved that February is the time when the public are ready to state their requirements and order cars. I suppose no one will contradict me when I say that most of the big firms exhibiting at Olympia did a far larger amount of business at this Exhibition than they had ever anticipated; at least, this was the experience of my own firm. Now, if this was such a successful exhibition, why alter the date, and hold our annual Exhibition in November? If we can do the same amount of business in November as we have already done in February I am agreeable, but is it to be expected that we are to get the same class of people and the same buying public to come into our Exhibition in November, and be prepared to definitely place their orders for delivery of their cars in the spring? I think not.

Then, is it not often the case that November is the month of rain and fog—real London fog? If we were to have a fortnight of dense fog during the Exhibition in November it would be a huge fiasco. I admit this argument can be used against holding the Exhibition in February, but as a rule the weather is better in February than in November, and again, the manufacturers are increasing their output, more manufacturers and more agents are coming into the business, and obviously there will be a larger number of cars next year for immediate delivery than there has been this year. I admit that a few firms may have dropped out of the business, but nothing like the number that are coming in.

Further, is it to be expected that a would-be-purchaser will come to our Exhibition a month before the Paris Salon, believing in his own mind there will be plenty of cars for delivery in the spring, and be prepared to order his car right away? I think not. Will he not rather come into the Exhibition to merely take a look round, and say:—"Well, I'll go over to Paris, look at the Exhibition, and see what is new there, and will then wait until after the New Year to decide what I will buy." We are well aware that the main idea in a purchaser's mind is this:—"If I have the ready money to pay for a car I can purchase it when I like."

I am not using these arguments against the manufacturers holding their Exhibition in November, for I believe that if the manufacturers have their new models on their stands in November they will receive quite a large number of orders from the agents; but what is the agent going to do? If he wishes to exhibit at Olympia he has got to do one of two things; he has either got to sign the bond, and be content with exhibiting at a time of the year when it is a mere gamble as to whether it will be a success or a failure from a selling point of view, and be shut out from exhibiting at any other Exhibition within twenty miles of Charing Cross for a year, which means that if the Show has been a failure from a business point of view he cannot exhibit at another Exhibition in the spring, or, if he does not want to do this, he certainly may apply for space, but will stand

a very poor chance of getting it. But just let me show him where he comes in if he does not sign the bond at Olympia. Obviously he wants very much to exhibit where his competitors are exhibiting, and if he does not sign the bond I think it is only a waste of money to apply for space at Olympia, for:—

The first ballot for choice of position will be confined to bond-signers who have signed the 1902, 1903, and 1904 bonds. (About 8 firms.)

The second ballot will be confined to bond-signers who have signed the 1903 and 1904 bonds. (I believe 21 firms.)

The third ballot will be confined to bond-signers who have signed the 1904 bond. (A very large number.)

The fourth ballot will be confined to bond-signers who have signed no previous bond. (A still larger number.)

The fifth ballot will be confined to members of the Society not signing the bond.

In my belief, those taking part in the third, fourth and fifth ballots will have a miserable chance of finding good space, especially if they come out at the end of the ballot.

I believe that since the Exhibition over forty new firms have applied for membership of the Society of Motor Manufacturers and Traders, and all these firms will be wanting to exhibit at Olympia, and where are we all going to get space? It is all very well to say, "Cut down the space," but I think the spaces were quite small enough at this year's Exhibition, and what will it be like at the next Exhibition? Bear in mind that there will be a large number of firms who will want space in the heavy vehicle section, boat section, and machinery section, in addition to the ordinary pleasure cars, and where are they all going to be put? No, the Society's position now is quite strong enough without any bond, and, in fact, in my humble opinion they are strong enough to hold a manufacturers' show and an agents' show, if they wish to do so. But, having settled that they will not hold two shows, there is no reason why a bond should be held over the heads of the manufacturers and agents, which, if signed, means that they can only show at one Exhibition, held at a date which is questionable as to whether it will be a business success, because I am quite clear that, if the bond is not signed, it is no use applying for space, for no one wants to be relegated to some corner under the gallery or up in the gallery. I look upon it as being waste of time to go to Olympia in November unless the bond is signed, and even then it will only be a dog's chance to get suitable space.

In conclusion, in my opinion, the bond has served its purpose; it has made the Society of Motor Manufacturers and Traders what it is to-day, it has made the Society's Annual Exhibition an assured success, and now let it drop. Do not let us run the Exhibition for the manufacturers alone, but let us have some consideration for the agent, who has a very important interest, and also for the buying public, who, after everything said and done, is the great controller of both the manufacturer and agent.

I have written you at some length, but the matter is of the greatest and most important urgency, and I shall be happy to hear from any members of the trade—manufacturers or agents—who are of my way of thinking.

Yours faithfully,

WM. LETTS.

45, Gt. Marlborough Street, W., March 27th.

MISS MARIE CORELLI's denunciation of the motor car has become a recognised institution, and now takes rank with her diatribes against literary critics. But one is rather sorry to find her example followed by an authoress of whom one would not have expected it. "Ouida" has recently been declaring:—"As regards automobiles they are my *bêtes noires*. They are hideous, perilous, monstrous. They disfigure the face of the earth; they crush children and dogs to powder; they increase the modern delirium which makes people tear madly from place to place, learning nothing, wasting their time and money in an insensate and perpetual gyration." Mdlle. de la Ramée was always devoted to dogs, and she has evidently taken on trust some of the fallacious statements of Mr. Perkis and his league. Miss Corelli maintained that she had never been in a motor car, and abused it in consequence from the pedestal of lofty ignorance. We fear Mdlle. de la Ramée is in practically the same position.

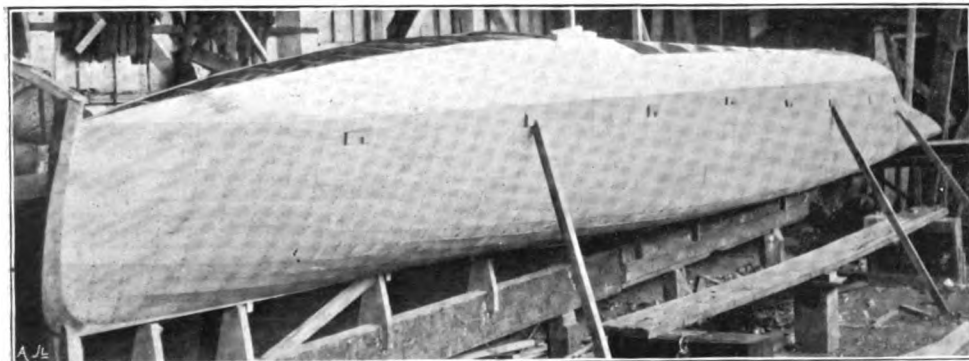
MOTOR BOATING.

THE BROOKE RACING LAUNCHES.

"BABY II," which is the new 30-foot boat built by Messrs. J. W. Brooke & Co. at Lowestoft, has now been completed, and has been despatched to Monaco to take

to run against much larger boats—ranging from 8 to 12 metres. She therefore stands very little chance of actually winning, but, being capable of attaining a speed of about 20 knots per hour, should give a good account of herself.

The larger racer, "Brooke I.," is now well in hand, and even when we were in Lowestoft recently her enormous 300-h.p. engine was nearing completion. The hull is 12 metres long, with a 5 ft. 6 in. beam, and her engine has six huge cylinders of a very similar design to those on the new 35-h.p. model. It is hoped that "Brooke I." will be able to attain a speed of 30 knots per hour, when



The Brooke Racing Launch, "Baby II," nearing completion in the shops.

part in the races there. The hull is shown in a nearly completed state in one of our illustrations, in which the general shape is rendered clear, and the boat, undergoing her trial spins, is seen in the pictures below. Although built for speed, seaworthiness and comfort have by no means been sacrificed to this end, for she is a decidedly roomy craft, and has plenty of free board. The beam is 5 ft. 9 ins. and the shell is formed of one skin of $\frac{3}{8}$ in. cedar.

The engine is fixed forward of amidships, and is identical with that employed on the new 35-h.p. Brooke car, except that the crank-chamber is suitably modified. The bore and the stroke of the four cylinders are $5\frac{1}{2}$ ins. and 6 ins., respectively, and the power developed is over 50-h.p. at 1,000 revs. per min. A high-tension system of ignition, from accumulators, is furnished, in addition to the low-tension magneto, and the engine has a main clutch of the internal expanding type, with metal-to-metal friction surfaces. Between the clutch-shaft and the propeller-shaft is a universal joint, and the thrust of the "Meissner" reversible propeller is taken by a large "Hoffmann" ball bearing.

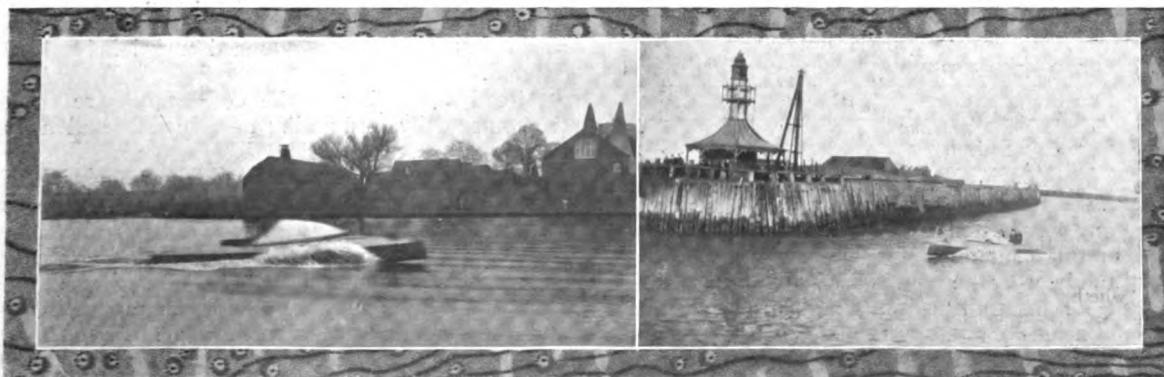
Owing to the length of "Baby II." she will not be able to compete in the 8-metre class at Monaco, but will have

she takes to the water early in June.

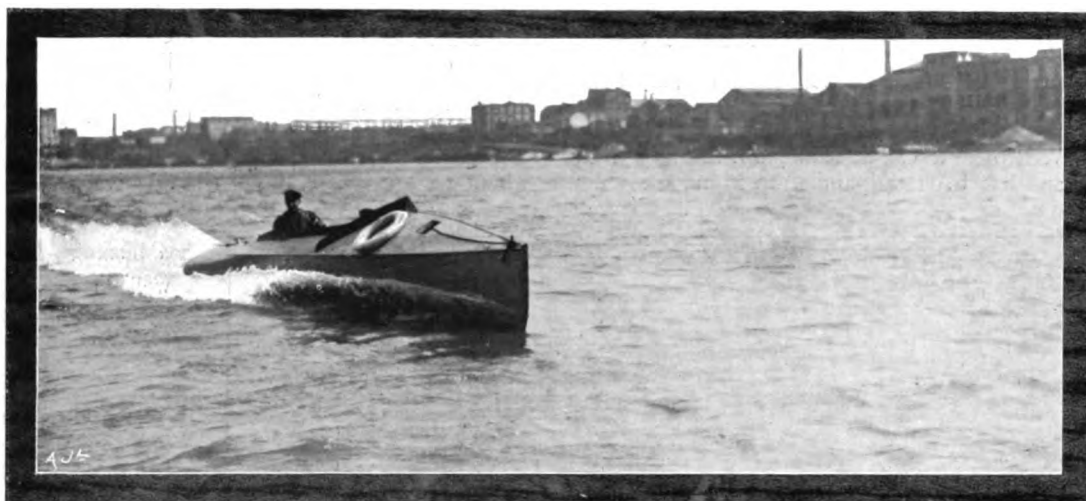
British International Cup.—The Selection Trial for British representatives is to be held, if possible, off Ryde on August 2nd, next.

THE big French yachting week, it has been decided, is to commence on July 27th instead of July 29th at Havre.

IN connection with the Budapest Automobile Exhibition taking place from May 7th to 21st next under the auspices of the Hungarian Automobile Club, a special feature will be made of motor boat competitions. These will be held on the lake in the city park of Budapest, and as the vast waterways of Hungary are very suitable for the use of motor boats, it should be a good opportunity for British builders of motor boats to have their craft in evidence in these competitions with a view to future profitable business. The representatives in this country appointed in connection with the Exhibition are Messrs. Louis Felberman and Joseph Offord, 92, Gloucester Road, South Kensington.



Two views of "Baby II" undergoing her trial runs at Lowestoft.



View of Mme. du Gast's 90-h.p. Racing Boat, "Turquoise," at full speed, which has recently been launched—and christened by Canon Dumont—and is to compete at Monaco next week.

The Church and the Motor Boat.—No one can now say that the Catholic Church in France is anti-progressive, for the interest felt by a dignitary of that persuasion in motor boating—and Madame Du Gast—has manifested itself by formally baptising the motor boat, "La Turquoise," which has been built for that sporting lady, and which was recently tried by her on the Seine.

performed, Madame Du Gast herself did a quick change of costume, and ran the boat at high speed up and down the river amid the vigorous plaudits of her guests, whom she had invited to attend the "christening."



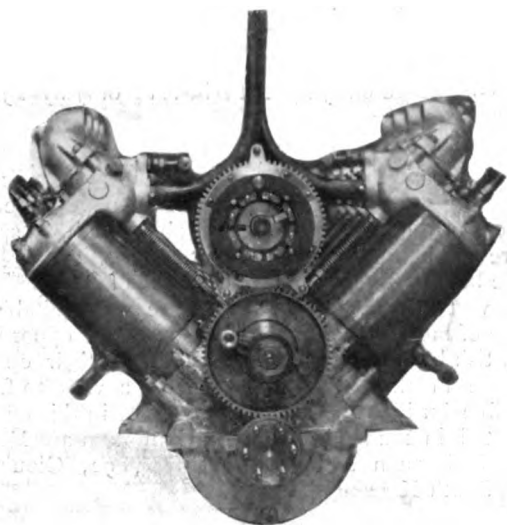
RACES, RECORDS, AND TRIALS.

Gordon-Bennett Cup Race.—The date officially selected by the A.C. de France for the running of this race on the Auvergne Circuit is announced as July 5th, and the French Eliminating Trials—for which entries close at 6 p.m. on April 1st—are to be held over the same circuit on June 16th. The date of May 23rd for the British Eliminating Trials in the Isle of Man we announced last week.

In regard to the application of the French club to the other recognised clubs for permission to shorten the circuit, so as to enable the start and finish to be at the same point, all round sanction is already practically agreed to. A query could hardly arise, however, as from an error in measuring when the application was made it would appear that, instead of there being a difference of about 20 kilom., it is only a matter of about $\frac{3}{4}$ kilom. which is to be knocked off the minimum distance authorised under the rules. Since last week further entries have been made for the French Eliminating Trials, bringing the total up to 21, viz., an "Automoto," to be driven by Taperlot, and the three De Dietrich cars, which last week we announced unofficially would be entered.

Already a number of the competitors are traversing the course daily, and noting every possible advantage to be gained by skilful driving.

The Gordon-Bennett racers, which are being built this year by the Darracq Company at their Suresnes works, are, we hear, to be of the live-axle type, with a wheel-base of about 7 ft. 6 in. The 4-cylinder engines, with a bore of 160 mm. and a stroke of 140 mm., develop about 85 b.h.p.; they are fitted with magneto ignition, and they have all the valves arranged above the combustion chamber. Another departure from previous practice is that the change-speed-gear is combined in the same casing as the differential-gear, on the back axle.



No less than eight cylinders are employed in the 90-h.p. "Antoinette" engine, which is fitted to Mme. du Gast's Racing Launch, "Turquoise." The cylinders are placed diagonally, four on each side of the crank-chamber, with the valves on the inner side of the heads, and with the ignition-plugs centrally above the cylinders. Another interesting feature of the engine is that it is rendered self-reversing, by displacing the camshaft so that no other reversing gear of any kind is required.

The ceremony was carried out by Canon Dumont, who appeared in full canonicals for the purpose, and duly christened the boat by the name which had been selected for it. But for his indisposition, indeed, the baptism would have been celebrated by the late Bishop of Dijon, but, failing the prelate's ability to appear, the ceremony was carried through—and quite effectively, too—by the Canon. As soon as the rites of the Church had been

As regards the attitude of the celebrated Mors firm to this year's Gordon-Bennett Race, considerable uncertainty seems to prevail. They have not, so far, entered for the Eliminating Trials, but are nevertheless building three racers and two reserve cars. Whether this means that they anticipate that they will finally enter at the last moment, or have some other move in view, must for the present remain uncertain. In the meantime, particulars of these vehicles are of interest and as at present divulged are as follows:—The chassis is very low, the frame being only 43 centimetres from the ground, and quite unusually narrow. The radiators will be of the finned tube type, and the driver's seat is brought even further back than formerly, the result being that the steering-pillar is almost horizontal. The motors, which will develop approximately 125-h.p., have 4 cylinders with a bore of 170 and a stroke of 150 mm. The cylinders are slightly out of line with the axis of the crank-shaft, as in the case of other recent Mors engines. On the third speed the drive is direct to the counter-shaft, and the gear-box is large and short, with a view to preventing any distortion from strains. The ignition is, as usual, low-tension. The special arrangement of the bearings for the differential shaft allows the weight to be kept low although the car is of the chain-driven type, and none of the vehicles, when ready for the race, will weigh more than 800 kilogs. The speed, of course, is not a matter of certainty, but it should be borne in mind that 40-h.p. cars of the same type developed 106 kiloms. per hour on the flat last year. Whether the Mors cars enter for the Eliminating Trials or not, they will probably give a good account of themselves during the racing season, and it is anticipated, at any rate, that they will contest the Circuit des Ardennes, in which one of them will probably be driven by M. Emile Mors himself.

Tourist Trophy Race.—We gave the latest entries for this race up to the time of going to press last week, when the official total was 35. Since then more entries have been added, bringing the number up to 40, the 5 additional entries being Mr. W. H. Arnold, one Whitlock car; Mr. R. Dennis, two Dennis cars; Hon. C. S. Rolls, a Minerva; and Mr. W. M. Appleton, a "Bristol" car.

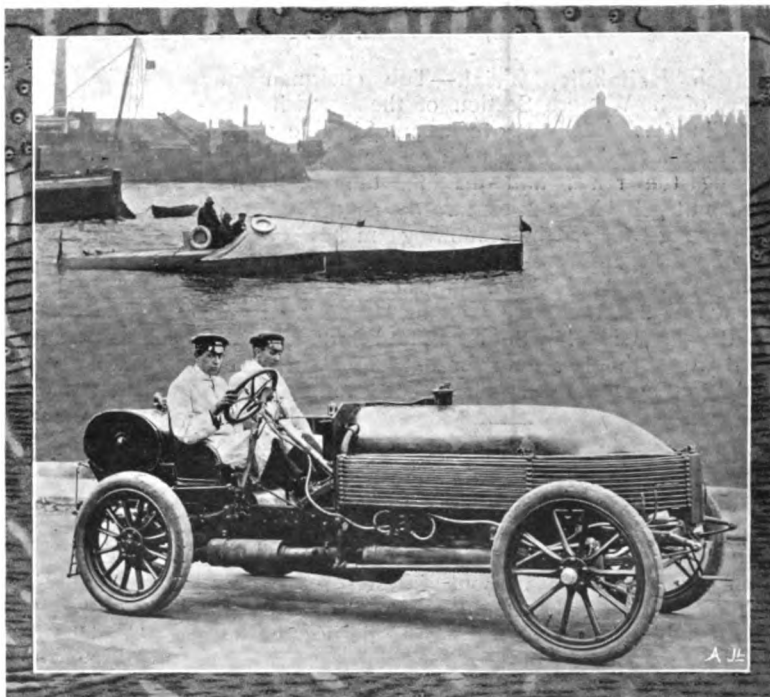
The Continental Caoutchouc and Guttapercha Company have come forward with an offer of important prizes in connection with the Tourist Trophy. They have decided to give a cash prize of 100 guineas, or a cup of this value, to the winner of this event, provided that his car is fitted with Continental tyres. In addition to this, they have also undertaken to award a 10-guinea cup to the car, fitted with Continentals, which accomplishes the fastest circuit regardless of other conditions.

Vanderbilt Cup.—As several French firms have already entered cars in excess of the five allowed to each

country in this race, a selection has become necessary, and it has, therefore, been decided that entries will close on May 15th, and a selection will be made of the first cars up to five (entered for the Vanderbilt Cup) in their order of finishing in the French Eliminating Trials for the Gordon-Bennett Cup Race. At present there are entered for this race 3 Panhards, 3 De Dietrich, and 3 Clements.

Circuit des Ardennes.—It has been decided to run the Ardennes Circuit Race this year on August 6th and 7th. On the first day voiturettes and motor bicycles will compete on the Arlon or small Circuit, and on the 6th, round the big Bastogne Circuit, the monster racers will take their turn. A "caravan" is being organised to Liège the day following the circuit races. On the 9th a hill climb at Chenée, for racing and tourist cars over a kilometre, is to take place. On the 10th motor boat races will be held on the Meuse; and on the 11th a tourist "regularity" run over 130 kiloms. will take place; and on the 12th events for cruiser motor boats and for the mile and kilometre championship will be held.

Ostend Motor Week.—The events arranged for this annual fixture are:—July 10th, 10 kiloms. for racers, 5 kiloms. for tourist cars; 11th, flying kilom., racers and tourist cars; 12th, a long distance trial for tourist cars of less than 32-h.p.; 13th, speed mile, racers and tourist cars; 14th, appearance competition; 15th, exhibition of the cars, prizes, &c.



We referred recently to the fact that the Napier products this year hold the records for speed both on land and water, and the photograph which we reproduce above may serve as an interesting memento of the fact, as it shows both the celebrated Yarrow boat (with Mr. John Tucker at the wheel, and Mr. John Pugh, the Napier engineer, on the starboard side) and the celebrated car, with Mr. Macdonald driving, "assembled" in one picture by the photographer's art.



The growth of automobilism at the Antipodes is well illustrated by the view we reproduce above, showing some recent arrivals in the Colony, one of which is a 6-h.p. Wolseley, and another an 8-h.p. car of the same make. The owner of the former vehicle, Mr. Thomas Crosse, who lives at Hastings, took the little car out for a trial run to the top of Patoka Hill, an eminence of 1,700 ft. high and 36 miles distant, more than half the road to which consists of hills, valleys, and sharp curves. In spite of the difficulties presented by the road, the very excellent time of 76 miles in 4 hrs. was made with two passengers up, the amount of fuel consumed being low under the conditions. The occupants of the cars, reading from left to right, are:—Mr. Crosse, Mr. A. H. Russell (Chairman Directors, A. Jones and Sons, Limited), W. B. Jones (Managing Director, A. Jones and Sons, Limited), Miss Russell, Mrs. A. H. Russell, Mr. A. O. Bishop, Mr. D. O'Reilly, Pu Kauauria.

Scottish Reliability Trial.—The chairman and secretary of the Western Section of the Scottish Automobile Club have just been over a considerable portion of the Reliability Trial route, taking place in May next, inspecting the roads and making the preliminary arrangements. The entries already completed comprise, among others, the following makes of cars, some of which are represented by various types:—Albion, Argyll, Ariel, Arrol Johnston, Chenard and Walcker, Daimler, Darracq, Gladiator, Humber, Minerva, Mors, Peugeot, Siddeley, Sunbeam, and Swift.

April 5th is the last date for entries at single fees. Intending competitors should hasten to be in time.

Voiturette Trials—The rules issued by *L'Auto* in connection with these Trials have again to be amended, this time in consequence of the decree recently issued by the A.C. de France that only one big *speed* event would be permitted on the French roads for 1905. The final portion of the trial was a speed test over 250 to 300 kiloms. Naturally the question at once arose, should this be allowed, and the A.C. de France have decided that no speed in any car trials, except over short stretches, is to be allowed on the public roads beyond 30 kiloms. per hour. The rules, therefore, of the Voiturette Trial have had to be modified accordingly, and *L'Auto* intends to offer three challenge cups, one to each of three categories, in which the classing will be by cylinder capacity, viz., (1) cars with cylinders under 1 litre, (2) under $2\frac{1}{2}$ litres, (3) under 5 litres. Various qualifying rules regulating each class are to

be issued in regard to the weight of chassis, carriage body, passengers, speed on the hill, speed on the flat, &c.

Wheel and Anti-Skid Device Trials.—The long-distance test for wheels and anti-skid devices, the start for which we recorded in our issue for March 18th, concluded on Sunday last in Paris, when the first place was awarded to the 12-h.p. Corre car, fitted with Vulcan pneumatic tyres, both back and front wheels. Only one prize being available, the judges regretted they were unable, therefore, to allot another prize to the Samson leather bands, which were fitted to a 24-h.p. De Dietrich car, and which had shown such splendid wear over the long road test, especially when it is borne in mind that the weight of the De Dietrich car laden was about 2 tons. It will be remembered the distance run was 4,000 kiloms. from Paris to Biarritz, Genoa and back.

THE Sneden Cup was decided on Sunday last in Algiers for the third time. The event is a speed trial over a kilometre. Mons. P. de Malglaive, on his 45-h.p. De Dietrich car, was the successful competitor, who, with a strong wind against him, was timed for 35½ secs.

THE German Automobile Club propose organising an international heavy vehicle trial to take place during the autumn.

EXELBERG HILL-CLIMB, it is announced, will be abandoned this year, and probably for all time, by the Austrian A.C.

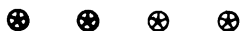


Some months ago, we referred to the road specially designed for automobile purposes which a syndicate proposes to construct in France between Biarritz and Arcachon. The proposed road will run through some rough country, and also through the celebrated Landes district, where the inhabitants, as most people know, stalk about on 10-ft. stilts. A number of enthusiastic supporters of the scheme recently organised a tour over the district, to inspect which they had to make use of the quaint mule-carts which form the principal indigenous means of locomotion in the neighbourhood. Our illustration shows the party in these conveyances at a clearing in the Forest of St. Girons. The special yokes, for keeping the cantankerous mules out of biting range of one another, form a noticeable feature of the equipage.

THE noted Morris Park Trotting Track in New York is to be devoted, it is reported by cable, for the future entirely to automobile racing.

A 20-MILE private speedway is proposed to be constructed in the United States. From the plans prepared the scheme looks to have the elements of success. The point selected is between Pennington, N.J., and the Delaware River. Pennington is 51 miles from New

York, 39 miles from Philadelphia, and 8 miles from Trenton, and is served by two railways. The plans provide for a "circuit" of 20 miles, with natural grades, a 2-mile oval track, and a practically straight stretch for high speed of 4 miles. All the curves are so arranged as to allow of full speed being maintained completely round the course, and the road proper is to be 30 feet wide. The scheme has strong financial backing, and may possibly, therefore, not end, like many similar propositions, in smoke.



MOTOR CYCLING.

Auto-Cycle Club.—Sir Arthur Conan Doyle and Mr. Charles Jarrott are among the new members elected to the Club.

Mr. H. M. Wyatt's postponed paper on "Magneto Ignition" will be read on April 14th.

The following members have been elected to represent the Auto-Cycle Club on the Trials Advisory Committee for the 1,000 Miles' Trial this year:—Messrs. Boileau, Nixon, O'Gorman, Pennell, Perman, Reynolds, Sampson, Sharp, Smith, Tuchmann. A meeting of motor cycle traders will shortly be called for them to elect their representatives on this committee.

Entries in the Auto-Cycle Club's Hill-climbing Competition, on May 6th at Fenhurst, will be classified as follows:—

- | | | |
|----------|--|---|
| Class 1. | —For machines with engines not exceeding | 70 × 70. |
| " 2.— | " " " " | 76 × 76. |
| " 3.— | " " " " | 85 × 85. |
| " 4.— | " " " " | of any size. |
| " 5.— | " " " " | forecars, side carriages, and trailers. |

Medals will be awarded for the first and second men in each class, and in addition a medal for efficiency will be awarded to the machine doing best in the bicycle class, and one for the machine doing best in the passenger class.

International Cup Race Notes.—The date for the Selection Trials, in the Isle of Man, has now been fixed for May 23rd, and the distance will probably be about 200 miles. Entries closed on Friday of this week. The weighing in will take place at Douglas, on Saturday, May 20th.

Donations to the Cup Fund are coming in slowly. The following are the latest to contribute:—Lieut. H. G. Good (of Submarine A5 fame), Chater Lea Manufacturing Company, Beaumont Motor Club, and the Southern Motor Club.

THE race for the "Motor Cup" will be run in conjunction with the Selection Trials, starting at the same time, and over the same route. Any motor bicycle is eligible to take part in this event, provided it does not weigh more than 110 lbs., or 116 lbs. 9 ozs. if fitted with magneto ignition. The entry fees for this event have been fixed as follows:—

For members of the Auto-Cycle Club, who are not connected with the motor trade, nor have any pecuniary interest in the machine which they are entering, £1 1s.

For members of affiliated clubs, ditto, ditto, £1 5s.

For members of the trade and others, £2 10s.



An eloquent picture of the absolute devastation and ruin wrought by the Long Acre fire is provided by the photograph, which we give above, of a safe in the basement of the Ariel Company's premises being dug out when the debris had sufficiently cooled down to enable workmen to undertake the task. It is of interest to note how completely the safe escaped injury in the terrific conflagration, which wrought the ruin by which it is surrounded.

AERONAUTICS.

M. Archdeacon's Experiments.—The experiments which we chronicled some considerable time ago, organised and carried out by M. Archdeacon on the sand dunes of Berck Sur Mer, have undergone modification. The Archdeacon aeroplane no longer floats gracefully valleywards from the top of a sand dune in imitation of the Wrights' experiments, but it is operated like a huge kite by means of an automobile. At least, this was the experiment which M. Archdeacon tried on a recent occasion, assisted by a 60-h.p. Mors car. The aeroplane was arranged to start on a long slide, its runners travelling in two long wooden tracks which were greased, soft-soaped, and otherwise lubricated to reduce friction to a minimum. To the machine was appended a rope representing the string of an ordinary kite. The other end of the rope was attached to a Mors car, and when the car proceeded to get under way, the aeroplane ran along the slides and slowly and majestically soared into the air like a giant kite, carrying, unfortunately for itself, not the intrepid experimenter on board, but a sack filled with sand to represent him. Everything went well, as might perhaps have been anticipated, while the aeroplane was acting as a kite, but to a kite the string is essential, and a kite without a string, or with a string that is broken, is as insecure as a paper currency when its corresponding gold reserve has been dissipated. And the string broke. For a few minutes the aeroplane still wavered in the air, but ultimately it lost its balance and took a header to the ground, by which it was considerably damaged.

Now, this appears to us altogether the wrong way to experiment. There is no doubt that you can get an aeroplane aloft by the method adopted. There is no doubt whatever that an aeroplane like that of M. Archdeacon, possesses ample lifting power when propelled against the wind. The whole problem at issue is to learn to control it. We would suggest, with all respect,

that when the machine is repaired and is again ready for flight, that the experimenter takes his place upon it, taking care, of course, that the rope is this time sufficiently strong. Let the car start against a wind, and when the aeroplane is up, as the operator learns to control it, he should at least be able to learn to soar, so that the automobile can gradually slow down, the cord becoming slack, and the aeronaut accomplish gliding flight. If the power of the wind is insufficient, the motor car can proceed a little faster. In this way the process would become something like learning to swim with a belt and rope. No real progress will ever be made until experimenters recognise that the whole thing is a feat of dexterity, far more difficult than learning to ride a bicycle. Mere experiments to show that a particular type of aeroplane possesses the necessary lifting power are out of date. We have known that long ago.

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MR. MERVYN O'GORMAN will read a paper on "Carburettors" before the Automobile and Cycle Engineers' Institute on the 13th inst.

SPEED for motor cars on Grove Hill, Harrow, is now officially limited to 5 miles an hour, under an order from the Local Government Board. This is the spot where several fatal accidents have occurred within the last few years.

THE motor omnibus service on the Edgbaston and Harborne Roads, which is being run by the Birmingham and Midland Tramways Company, is to be augmented. At present these districts are served partly by motor 'buses and partly by horsed vehicles, and the intention now is to entirely replace the latter by mechanical vehicles.

THE business of the Mo-Car Syndicate, Limited, of Paisley, has been acquired by a new company, which will continue to manufacture the type of car made by the original firm, known as the Arroll-Johnston car. In addition the new company propose putting on the market at an early date a new type of car of a popular design.

THE increasing interest in the application of vehicles propelled by internal combustion motors to railway purposes, is illustrated by the circumstance that Mr. P. Dawson recently delivered a lecture before the Coventry Engineering Society. Mr. Dawson looks forward to a great development of the railway automobile propelled by the petrol motor, for, as he points out, in the first place all tyre troubles are eliminated, and owing to there being no need for a differential the efficiency of transmission is also increased. Amongst other points in favour of the petrol motor for light service on railways Mr. Dawson drew attention to the fact that during long stoppages in railway stations the petrol motor consumes no energy at all, as compared with the ordinary locomotive, which consumes fuel all the time.

CLUB AND ASSOCIATION DOINGS.

Automobile Mutual Protection Association.—The annual general meeting of the association was held at the Agricultural Hall on March 25th, when the chair was taken by the president, the Right Hon. the Earl of Shrewsbury and Talbot. The Marquis of Londonderry, Sir David L. Salomons, Bart., and Lt.-Col. R. E. B. Crompton, C.B., were re-elected honorary vice-presidents. The following were elected members of council for the ensuing year :—Mawdsley Brooke (J. W. Brooke and Co., Lowestoft), Albert Brown (Brown Bros., London), Lt.-Col. Elton-Burroughs (Hewetson's, Ltd.), Jesse Ellis (Jesse Ellis, Ltd., Maidstone), Chas. Friswell (Friswell's, Ltd., London), Chas. Holmes (the Holmes-Prunel Co., London), F. P. S. Harris (the General Petroleum Co., London), Edward Lisle (the Star Engineering Co., Wolverhampton), J. J. Mann (Mann and Overton's, Ltd., London), John Maiston (John Maiston, Ltd., Wolverhampton), W. H. Maudslay (the Maudslay Motor Co., Coventry), W. R. McTaggart (W. R. McTaggart, Ltd., Dublin), W. Lecoq McBride (Renault Freres, Ltd., London), Augustus Pereno (the Farman-Automobile Co., London), A. Rawlinson (A. Darracq and Co., London), Bernard B. Redwood (Jacobs and Barringer, London), J. R. Richardson (J. R. Richardson and Co., Lincoln), W. E. Rowcliffe (the Hercules Motor Wagon Co., Manchester), Henry Spurrier, jun. (the Lancashire Steam Motor Co., Leyland, Lancs.), D. M. Weigel (Clement-Talbot).

Beaumont Motor Club.—The opening meet of the club, which took place on March 18th at the Castle Hotel, Woodford Green, was entirely successful, about 300 members and friends attending. Mr. Alan Vickers, of the Southern Motor Club, presided, and was supported by Mr. W. Marshall, Mr. A. J. Wilson, Mr. J. H. Burley, Mr. F. Straight, Mr. J. F. Crundall, Mr. A. F. Ebbelwhite, &c. In the evening a long musical programme and an interesting lecture on the 1,000 Miles Motor Trials, illustrated by lantern pictures, was given before a large and appreciative audience. A souvenir, which dealt entirely with the 1,000 Miles Trials, was a very artistic and welcome memento of the occasion.

County of Durham Automobile Association.—The second annual general meeting of the Association was held at the County Hotel, Durham, on March 21st. The president, Sir Lindsay Wood, Bart., who is himself a motorist, occupied the Chair, and there were

present representatives from all of the six districts comprising the Association, including Gateshead, South Shields, Sunderland, the Hartlepoons, Stockton and Darlington.

The report of the committee gave the present membership of the Association as 155, and it may be noted that the Association ranks as third amongst district organisations, leaving out, of course, the national clubs, such as the A.C.G.B.I. and the Scottish and Irish A.C.'s. The officers of the Association were retained for the present year, as follows :—President, Sir Lindsay Wood, Bart; chairman, Major H. S. Streatfield; hon. sec. and treasurer, J. E. Hodgkin; auditor, F. C. Squance; solicitor, J. A. Williamson.

Ladies' A.C.—The "at Home" of the club at the Agricultural Hall last week, upon the invitation of Mr. and Mrs. Cordingley, was attended by about 200 guests. Pleasant music was discoursed during the proceedings by Madame Angelis's Pompadour band, and amongst those present were :—Mrs. Bircham, Mrs. Foyster Bowen, Mr. H. M. Buist, Mrs. Buttemer, Mr. Buttemer, Mrs. Herbert Cockbain, the Hon. Mrs. Corbet, Mrs. Cooper, Lord and Lady Edward Spencer Churchill, Mr. Fowler-Dixon, Madame E. Duke, Mrs. Henry Edmunds, Mr. Arthur Ellerthorpe, Mr. C. L. Freeston, Mrs. Frederick Foster, Mrs. Lesmoir Gordon, Mrs. R. A. Hadfield, Mrs. Guy Hardy, Mr. Frank Harris, Lady Hartopp, Mrs. D'Esterre-Hughes, Mrs. Hore, Miss Honeyman, Miss G. Honeyman, Mrs. Charles Jarrott, Mr. Basil H. Joy, Mrs. Gerard Leigh, Mrs. R. C. Leigh, Mrs. Mamelsdorp, Colonel and Mrs. Mark Mayhew, the Hon. C. S. Rolls, Mrs. de Lisle, Mr. H. Moroney, Mr. E. Kenealy, Mrs. Bruce Porter, Mrs. Piggott, Mrs. Richardson, Mrs. Benett Stanford, Mrs. George Thrupp, Mrs. Waller, Mr. and Mrs. Walter, Mrs. Herbert Whiteley, Mrs. Wightwick, Mr. Herbert Stourton, the Hon. Mrs. Stourton, Miss A. Kenealy, Mrs. Roger W. Wallace, Mrs. David Joy, Madame Lockert, Mdle. Lockert, and Miss D'Esterre-Hughes, secretary.

Manx Automobile Club.—A meeting of motorists of the Isle of Man was held on Saturday last in Douglas, when it was decided to form an automobile club for the Island, to be called "The Manx Automobile Club." Mr. George Drinkwater, J.P., Seneschal, was appointed president, Mr. George J. A. Brown, hon. secretary, and Mr. G. Gilmour, hon. treasurer. Intending motorists to the Isle of Man can communicate with the secretary if they require information. His address is : St. George's Chambers, Douglas.



Nearly every week sees the Napier car on which Mr. Glidden is now touring from island to island in the South Seas at some point of interest. Our readers of course recollect that on its European tour it penetrated the Arctic Circle in Europe, and that it has been further south than a motor car ever was before. We are enabled now to show the Napier car with Mrs. Glidden seated in it, and Mr. Glidden standing reflectively beside it, on the most southern road in the world, at a point at which it arrived on February 5th last. The nearest name on the map to the point illustrated is named "Bluff," and in the background, stretching to the horizon, is seen the celebrated sea of Tasman. The vegetation, on the left of the car, consists of flax.

A LANCASTER-CLEMENT car has just been acquired by Mr. G. H. Stephens, C.M.G., for use in Egypt, where Mr. Stephens shortly proceeds in connection with the railway system in that country.

FOUR Chelmsford omnibus chassis have just been ordered from Messrs. Clarkson (Limited), for early delivery in the colony of Victoria.

THE first new 1905 model 70-h.p. Mercedes car has just been supplied by Messrs. J. E. Hutton (Limited), to Mr. C. R. Rose, M.P., and Messrs. Hutton also last week delivered the first 100-h.p. Mercedes 1905 racing car to Sir Ralph St. G. Gore, Bart. A description of this letter appears in our current issue.

NEW COMPANIES REGISTERED.

Argyll Motors (Limited). Argyll Works, Hozier Street, Bridgeton, Glasgow.—Capital, £500,000 in 350,000 ordinary shares of £1 each, and 30,000 6 per cent. cumulative first preference shares of £5 each. Objects, to acquire the Hozier Engineering Company (Limited), at Bridgeton, Glasgow, and elsewhere, to take over all the assets and liabilities of the Company (except £14,900 debentures, which that Company will discharge); to manufacture and deal in "Argyll" motors, &c. Directors, W. A. Smith, A. W. Stevens, A. Govan (Scotch Company).

British Automobile Development Company (Limited), Donington House, Norfolk Street, W.C.—Capital, £100,000 in £10 shares (5,000 preference). Objects, to carry on the business of engineers, manufacturers of motors, motor lorries, &c.

Garrard-Maxfield Motor Manufacturing Company (Limited), Carlton House, High Street, Birmingham.—Capital,

£2,000 in £1 shares. Object, to acquire the business carried on by A. P. Maxfield, at 5 and 6, Aston Road, Birmingham, to acquire W. H. Ireland's patent relating to the manufacture of wheels of motor cars, &c. First directors, H. Parker, W. H. Ireland, H. Pullen, and A. P. Maxfield.

King's Motor Patents (Limited).—Capital, £5,000 in £1 shares.

Kuettner, MacDonell, and Cookson (Limited), 3, Adam Street, Adelphi, W.C.—Capital, £10,000 in £1 shares. Object, to carry on the business of railway and tramway constructors, motor manufacturers, electricians, &c. First directors, B. Kuettner, S. G. MacDonell, and B. Cookson.

Mitcham Motor Company (Limited).—Capital, £8,000 in £1 shares. First directors, E. N. Lewer and A. W. Aitken.

The Sutherland Motor Traffic Company (Limited), Golspie.—Capital, £6,000 in £5 shares. Object, to acquire the business of the Sutherland Coaching Company (Limited), and to convey mails, passengers, and goods, by means of motor or other vehicles in the counties of Sutherland, Caithness, and Ross. (Scotch Co.)

Westlake Motor Syndicate (Limited).—Capital, £500 in £1 shares. Object, to construct fast racing motor bicycles, for the purpose of competing in the eliminating trials for the Little Gordon-Bennett Race, and (if chosen by the A.C.G.B.I. or the Autocycle Club so to do) to represent England in the International Autocycle Club Race, to be held in France during 1905; also to carry on the general business of motor cycle and motor car builders, engineers, &c.

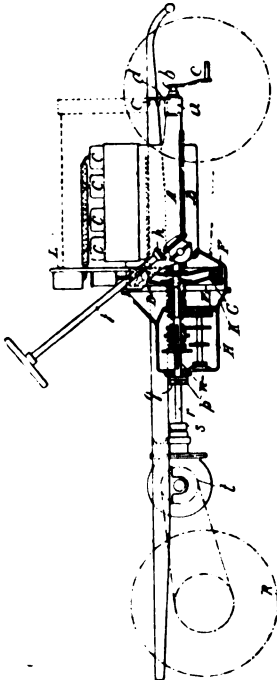
Worthing Motor Omnibus Company (Limited), 6, Bath Place, Worthing.—Capital, £10,000 in £1 shares. Object, to acquire the business carried on at Worthing as the Worthing Motor Omnibus Company. First directors, D. Brazier, H. Gates, W. Gates, H. W. Symonds, R. C. Isted, E. W. Page, T. J. Greenyer, and J. M. M. Erskine.



BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I. Mech.E. Thanet House, 232, Strand, W.C.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

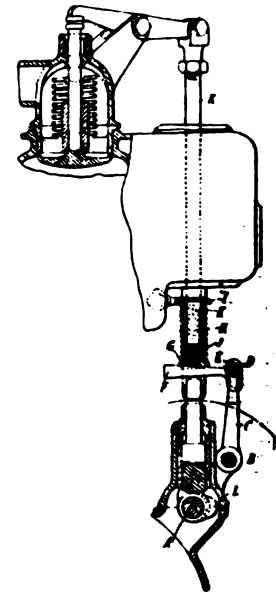
9804. 27th April, 1904. Novel or Improved Combination comprising the Construction of Engine Frame or Case and Gear Box for a Motor Car and the Means of Mounting the same upon the Framing of the Car. The Wolseley Tool and Motor Car Co., Ltd., of Adderley Park Works, Birmingham, and



Herbert Austin. This invention relates to a car in which the engine is vertical, and the crank-shaft is placed longitudinally or parallel with the length of the car, while the flywheel is placed between the engine and gear box. Fig. 1 is a part sectional elevation of a four-cylinder engine and gear box,

showing the means by which the back wheels are driven from the gear box. The engine casing, A, B, is formed as usual with an upper part, A, which carries the cylinder, C, and a lower part, B, bolted to A. The forward end of the casing, A, B, is formed with a bearing, a, through which the crank-shaft, b, passes, and at the end of which the starting handle, c, is fitted. The bearing, a, is formed with a bracket or lug, d, which is bolted to a cross bearer, e. The rear end of the casing, A, B, has a widened part, D, E, of which the part, D, is formed with A and the part, E, with B, and within this portion, D, E, of the casing is the usual combined flywheel and clutch, F, G. From the opposite sides of this widened out portion, D, E, of the casing, project brackets or lugs fixed to the sides of the frame. The gear box, H, is formed with an enlarged portion, K, which at its face is of the size of the portion, D, E, and is bolted thereto, thus making the gear box a rigid structure with the motor casing carried on three points only. The bracket, h, which carries the lower end of the steering spindle, j, is fixed to the casing, A, B. The dashboard, L, is also fixed to the casing. The end of the driven shaft, m, carries a box, p, which receives the head, q, of the universal joint. The head, q, is fixed to the shaft, r, which drives through a similar universal joint, s, the differential from which the sprocket wheels, t, drive the road wheels, R. March 23rd, 1905.

4954. 29th February, 1904. Improvements relating to Valve Mechanism for Motors. A. Clement, 33, Quai Michelet, Levallois-Perret, Seine, France. Date under International Convention, 29th August, 1903. This invention has for its object a valve-regulating mechanism for motors in which a variable lift of the valve is produced by interposing a wedge or inclined plane. There is one figure which is a part sectional elevation. Upon the same side as the half speed shaft, A, is arranged parallel thereto a shaft, B, upon which are keyed arms, C, equal in number to that of the cylinders of the motor. The arms, C, terminate in a fork, having a pin, D, which carries the slotted end, E, of the movable wedge, F. The wedge, F, is fitted to pass with slight friction through the guide, G, having an inclined surface against which bears a spiral spring, H, the other end of which rests against the fixed stock, I. The guide, G, is fixed by a pin, J, on its screw on the end of the valve spindle, and loosely engages the tappet or end of the rod, K, which is lifted by the cam, L. It will be clearly seen that the lift or opening of the valve is increased or decreased by the position of the wedge, F, in accordance with the thickness of the interposing part. The slot in its end allows of its movement vertically relatively to the pin, D. March 23rd, 1905.



Patent Specifications Published.

Applied for in 1904.

Published March 30th, 1905.

- | | |
|----------------------------|--|
| 2,724. | I. W. TYGARD. Intl. comba. engines. |
| 5,375. | C. H. DENT. Driving mechanism. |
| 5,660. | E. J. BUCKINGHAM. Intl. comba. engines. |
| 5,715. | SIR C. S. FORBES. Intl. comba. engines. |
| 10,099. | R. D. TODD AND W. H. HAZLEWOOD. Brake. |
| 10,254. | C. KOSTE. Variable speed gear. |
| 11,406. | W. H. FOX. Saddles. |
| 29,410. | L. RENAULT. Clutches. |
| 29,502. | SOC. ARIES. Driving wheels. |
| Published April 6th, 1905. | |
| 809. | A. S. F. ROBINSON. Spring wheels. |
| 6,389. | D. PARRY AND G. DEAN. Variable-speed gear. |

The Automotor Journal, April 8th, 1905.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

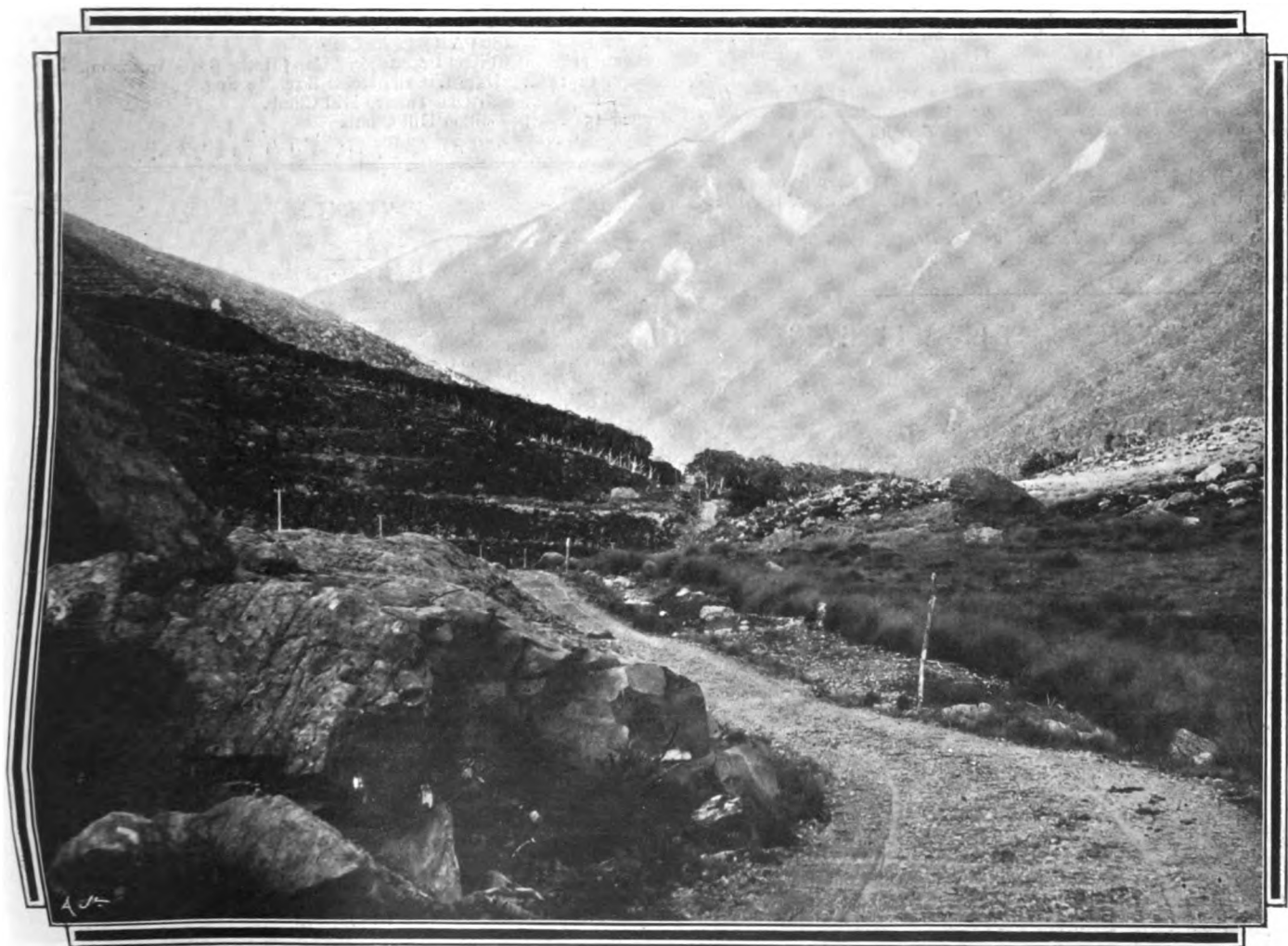
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The mountain scenery of New Zealand is celebrated for its grandeur, and in spite of the roads, which are in places extremely rough, the portion of Mr. Glidden's round-the-world tour which lay through that Colony must have been amongst his most enjoyable experiences. As a sample of the New Zealand scenery which he passed through, we are, thanks to him, enabled to reproduce the above beautiful mountain landscape, the rugged mountain which rises on the right being locally known as "Bluff Mountain." The road shown was traversed by Mr. Glidden's Napier.

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DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
Apl. 29 or May 1	May Day Parade
May 6...	Auto Cycle Club Hill Climb.
May 10-13 ...	Scottish A.C. R-liability Trials.
May 12 or 19...	*Quarterly 100 Miles Trials.
May 13 ...	Auto Cycle Club Members' Penalty Run.
May 20 ...	200 Miles Trial (Motor Cycling Club).
May 23 ...	*Gordon-Bennett British Eliminating Trials.
May 23 ...	Auto Cycle Trials and "Selection" Race.
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.)
June 10 ...	London-Edinburgh (Motor Cycling Club).
June 24 ...	100 Miles Passenger Trial (Motor Cycling Club).
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 4-5 ...	*Motor Boat Trials (Southampton).
July 8... ..	Auto Cycle Club Consumption Trial.
July 13 ...	*Hill-Climb (Henry Edmunds Trophy).
July 19-22 ...	*Brighton Speed Races.
July 27-28-29	*Blackpool Motor Meeting.
July ...	24 Hours Run (Motor Cycling Club).
Aug. 11 or 18	*Quarterly 100 Miles Trials.
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 19 ...	*Van Trials, Light and Heavy Vehicles.
Aug. 26 ...	Inter-Team Trial (Motor Cycling Club).
Sept. 9 ...	Brown Cup (Motor Cycling Club).
Sept. 12 ...	Auto Cycle Club Race Meeting.
Sept. 14 ...	*Tourist Trophy (Isle of Man).
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).
Sept. 18-Oct. 3	*Reliability Trials.
Oct. 4 ...	*Speed Trials.
Nov. 10 or 17	*Quarterly 100 Miles Trials.
Nov. 17-25 ...	Society of Motor Manufacturers and Traders Exhibition at Olympia.

* Automobile Club of Great Britain and Ireland Events and Papers.

Foreign Events (Trials, Races, &c.).

1905.	
Mar. 15-Apl. 9	Copenhagen Exhibition.
Apl. 2-16 ...	Monaco Motor Boat Fortnight.
Apl. 14-23 ...	Nice Automobile Week.
Apl. 17 ...	Speed Mile and Kilometre (Nice).
Apl. 18 ...	Coupe de Caters (Nice).
Apl. 20 ...	Coupe Burton (Cannes).
Apl. 20-21 ...	Cannes Motor Boat Meeting.
Apl. 23 ...	Coupe Provinciale (Nice).
May ...	Paris Industrial Vehicles Trials (A.C. France).
May 4-12 ...	Auto Cycle Club de France Tour.
May 11-25 ...	Stockholm Automobile Exhibition.
June 16 ...	French Selection Race for G.B.
June 18 ...	International Motor Cycle Cup.
July 5 ...	Gordon-Bennett Race.
July 9-22 ...	Ostende Automobile Meeting.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Calais-Ramsgate (Motor Boats).
July 16 ...	Mont Cenis Hill Climb.
Aug. 6-7 ...	Circuit des Ardennes.
Aug. 6-9 ...	Paris-Trouville (Motor Boats).
Aug. 10 ...	Gaston Menier Cup (Motor Boats).
Aug. 10-16 ...	Herkomer and Bleichroder Races.
Aug. 11 ...	Anthony Drexel Cup (Motor Boats).
Aug. 12 ...	International Cup for Motor Boats.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Vincenzo Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.
Sept. ...	Tourist Car Trial (A. C. de France).
Sept. 3-10 ...	Royan Meeting.
Sept. 3-10 ...	Spa Automobile Club.
Sept. 11 ...	British International Cup (Motor Boats Arcachon).
Sept. 12-14 ...	Lake Lucerne Motor Boat Meeting.
Oct. 1 ...	Chateau Thierry Hill Climb.
Oct. 15 ...	Gaillon Hill Climb.

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PASSING EVENTS.

Bogus Driving Establishments.

WHENEVER a new opportunity for profitable employment offers itself, there generally spring up a number of institutions desirous of teaching the rudiments of the new profession to those who are thinking of embracing it as a means of livelihood. Unfortunately, such institutions are not always as honest as they might be. Notable instances have been furnished in regard to the profession of typewriting, in connection with which the number of bogus schools, or schools in which the money of apprentices was taken and practically no instruction provided in return, was at one time legion, though the salutary effects of modern publicity have largely tended to weed them out. We greatly fear that something of the same kind is growing up in regard to schools for teaching motor driving to those who wish to become drivers. Mr. Worby Beaumont at any rate has been on the war path in this direction, and as may be gathered from his letter, which we print in another column, the result of his researches has been to convince him that though some of these institutions are well conducted enough, there are others which, as he rather amusingly phrases it, are nothing but "impetuous parasites," that is to say they take money for a course of lessons, the whole arrangement of which is farcical, and which teach the intending driver practically nothing at all.

Exposure and Suppression Imperative.

Now this sort of thing constitutes a particularly cruel form of fraud, because nine-tenths of those who pay for lessons at such institutions are men who desire to embrace automobilism as a means of earning a livelihood. To take money from people in this position, and either give them nothing in return, or what is still worse, that little knowledge, which is only a dangerous thing, is far worse than picking their pockets of the fees they have paid, for it wastes time which they can ill afford, and also tends to turn loose upon our streets a class of drivers (some of whom may consider themselves competent) who are nothing less than a menace to public safety and a danger to the future of the automobile movement. Alleged cases of the kind to which we refer ought, we think without hesitation, to be taken up by the Automobile Club.

The work is beyond the scope or resources of most individuals, except possibly Mr. Labouchere, and his hands are probably full enough as it is in exposing other abuses. But the club could, and should, investigate matters of this kind and make full exposure where abuses are discovered. Its resources and power are such that there would be little chance of the offending institutions ever attempting retaliatory measures in the shape of actions for libel, or coming off successfully if they did so. The evil which is growing must be nipped in the bud. We trust the Automobile Club may see its way to taking the matter in hand, and so add to the long series of valuable services which it has performed on behalf of the movement.

The Battle of the Bridges?

WHAT the House of Commons will do when deprived or released from Ministerial guidance, and when every member is left to vote (without the supervision of the whips) as seems good in his eyes, is one of those things which nobody can ever, even approximately, estimate beforehand. The division on the London County Council's Tramway Bill, or rather on that portion of it which referred to permitting the electric trams to be carried over Westminster and Blackfriars Bridges, and united along the Embankment, is a case in point, for the House was equally divided, an occurrence which has not taken place for many years, and the matter was only decided in the favour of referring the matter to the Committee by the Speaker's casting vote, the value of which was to a large extent discounted by the apologetic statements with which he accompanied it. Time and again the attempt has been made to obtain Parliamentary powers to run trams along the Embankment, and to bring them over the bridges, and time and again it has been thrown out. This is the first occasion on which there has been a majority in favour of the proposal, and that majority could not by any chance be narrower than it is. How the proposal will emerge from the Select Committee to which it is referred by the vote, is, of course, at present quite uncertain, and whether the House of Lords will not throw the Bill out altogether is even more uncertain still. The majority is such a narrow one in the House of Commons that the Lords would be thoroughly justified in doing so, and we are inclined to hope that this is the course which the Upper House will adopt. The amount of excitement that has been worked up on the question is very difficult to comprehend. The extension will benefit the South Londoners very little, and the vaunted petition which has been got up shows most convincingly that the South of London generally is little interested in the question. Out of all the teeming millions, but 110,000 signatures could be obtained! And what good will the measure confer? The present scheme is simply to bring the two lines of trams over the bridges and run them round the Embankment. Practically no one who employs the South London trams wants to go along the Embankment at all, and the practical effect of the measure will be simply an extension of the lines from their termini south of the bridges to stopping-places at the north ends. To attain this result an enormous capital expenditure will be involved, and we do not believe for a moment that it would have been contemplated by the County Council but for the hope that, once over the bridges, the trams will be allowed to extend up Parliament Street, and possibly up Regent Street, and certainly

up Farringdon Road to join the North London system. With these two lines of trams running, congestion will be more congested than ever, while the chaos that will reign while the streets are being "trammed" will beggar description. Locomotion over Westminster and Blackfriars Bridges will practically be suspended, and probably many a member of Parliament, struggling in the chaos, will heartily wish he had voted the other way.

♦ ♦ ♦

Too Late.

AND what is all the fight for? Twelve years ago there might have been something in it. Then, at any rate, the prospects of the electric tram were rosy. Now, as we have repeatedly pointed out, they are more than threatened. In fact, after being, on the average, twelve years behind other towns, particularly on the Continent, the London County Council adopted the electric tram at the eleventh hour. Whether it is really paying or not is one of those things that we shall probably never know, for the trading of municipalities is never audited like that of ordinary commercial companies, by independent auditors. But, whatever may be the actual state of affairs at the present moment, it does not require the gift of prophesy to see that the most serious inroads will be made upon the profits in the near future. The Council dare not say to the ratepayers that they have made a mistake, and so they are making a desperate effort to improve the position of affairs by inserting the thin end of the wedge for a scheme to connect up their northern and southern systems. The absurdity of doing this just at the very moment when the whole electric tram system is threatened, is obvious enough. The Council would have been far better advised—would have been consulting the interests of its ratepayers far better—had it, instead of squandering their money in costly Bill promotion in Parliament, and even more costly tramification of the streets, decided to run with the times and extend its tramway system by a system of motor 'bus lines. But to do this would be to admit that the electric tram is not all which the Council once supposed and stated it to be, and it requires men of exceptional calibre to admit that they have made a mistake.

♦ ♦ ♦

The French Motor Car Trade and the English Industry.

SOME of our French contemporaries seem to have been thrown into a condition bordering on trepidation by the articles recently appearing in *The Times*, so strenuously advocating that British automobilists should invariably spend their money at home in the purchase of British-built cars, rather than allow the rival nation to profit by the money they have to spend. M. Georges Prade, in *Les Sports*, has been taking the subject up, and pointing out to French manufacturers that after all this country forms the best French market, and that the exports of French cars to England, Germany, and America amount to more, annually, than the home demand. Neither M. Georges Prade, in *Les Sports*, nor M. Leon Bailby, who writes in *La Presse* on the same subject, however, suggest that anything can be done. They recognise the danger, and point it out to their compatriots, and there they leave the matter. That is probably where it will have to be left. On the other hand it is not much use for *The Times*, or any other paper, to appeal merely to patriotism. Value for his money is what every purchaser, who is prepared to go to the

expense of buying an automobile, wants. Fortunately numerous British manufacturers are able to ensure him obtaining it, while over and above this there is the very great advantage of being able to procure spare parts for his car more readily when he lives in the same country with the manufacturer. This point is really of very great importance, indeed, and we would recommend writers in *The Times*, and also the British Motor Trades' Alliance, which is working hard to benefit the British industry, to lay rather more weight on these points than merely on the more patriotic aspect of the case. After all, it is the *argumentum ad pocketum* that wins. We have always advocated everything which can conduce to the benefit of the British industry, and it is satisfactory, therefore, to find so serious a view taken of the situation by our French contemporaries, as it is the best proof of the genuine progress made by British manufacturers.

♦ ♦ ♦

The Boat Race and the Motor Boat.

ALMOST since the University Boat Race has been an institution, the contending eights have been followed by a crowd of steam launches, on the fore-most of which the representatives of the daily Press have usually been accommodated. The absurd contrasts between the two tiny eights and the squadron of tearing and hooting steam tugs, belching forth volumes of black smoke from their funnels, has on more than one occasion formed the subject of laughable illustrations and cartoons in *Punch*. This year's Boat Race, notable in many respects, is perhaps most notable for the fact that, for the first time on record, a motor boat, driven by internal-combustion engines, carried the Press committee. The motor boat itself is a memorial to the enterprise and progressive tendencies of the Yarrow firm, which, as our readers are well aware, is doing such valuable work in the development of the motor boat. Not only was the boat, which is of considerable size, built in the Yarrow works, but the Yarrow firm also constructed the engine, which develops 70 i.h.p., from drawings supplied by the Napier Company. We referred to it in our number of March 11th. The quiet running of the motor boat, and above all, of course, the total absence of smoke, contrasted very favourably with the behaviour and appearance of the customary steam launches, and provided to the thousands lining the banks, the useful demonstration of the superiority of the new type of water locomotion, at any rate for river work, to the old. The demonstration can scarcely fail to have a most favourable effect in still further securing for the motor boat supremacy on all our inland waters.

♦ ♦ ♦

THE extravagance of the London County Council with the ratepayers' money is well illustrated by the recent proposal of the Finance Committee that £5,860,470 should be allowed for next year's expenditure. It is already proposed to spend £351,900 on the electrification of the tram lines transferred from the South London Tramways Company. Mr. Burns, one of the protagonists of the electric tram, calmly declared that motor omnibuses were as dead as the trolley system (the wish is, doubtless, father to the—we will not say thought—but expression), and urged the Council to boldly make the plunge, and electrify the northern tramways on the conduit system. The courage of some of these progressive gentlemen in spending *other people's money* is truly heroic.

THE DEEP-SEA CRUISER, "NAPIER MAJOR."



Fig. 1.—"Napier Major" cruising on the Thames. She is fitted with a standard 20-m.p. 4-cylinder engine and reversing gear, and is capable of maintaining an average speed of about 8 knots per hour.

IN no way does this, the latest of the "Napier" motor boats, resemble those others which have been engined by this well-known firm. The "Napier Major" is, in fact, a distinct type of motor boat, which has been designed as a compact and seaworthy cruiser. Not built for speed, her hull—constructed by F. Miller, of Oulton Broads—is naturally quite unlike the high-speed boats which have hitherto borne the "Napier" name. The overall length of the boat is 45 ft., the load water-line 40 ft., the beam 9 ft. 6 ins., the draught 3 ft., and the displacement 12 tons. The general lines of the hull, both in and out of water, are clearly shown in our photographs, Figs. 1 and 2, while a view of the interior of the engine-room and

cabin is given in Fig. 5. The engine, together with a separate view of the reversing gear, is shown in Fig. 3, and a line drawing showing the plant in elevation and plan is given in Fig. 4.

The hull has been built of larch, with oak frames and steel floors. There is about 6 ft. head room in the cabin

and the cabin top stands up some fourteen inches above the deck. The engines are of the 20-m.p. four-cylinder type, and are placed amidships, where they are thoroughly well protected, and the engine room, which can be shut off from the cabin proper, is particularly roomy and would accommodate, if necessary, a much larger engine.

One of our illustrations, Fig. 3, which is repro-

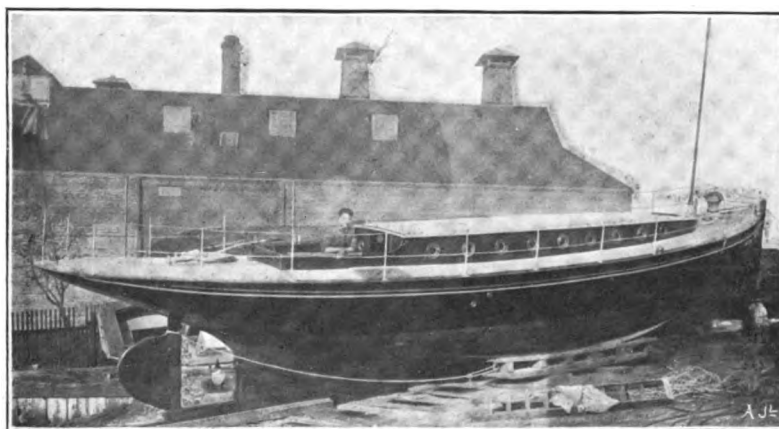


Fig. 2.—View showing the cruiser, "Napier Major," on the "slips" at Lowestoft. The boat is 45 ft. long, with a 9 ft. 6 in. beam. The interior is fitted up with a roomy cabin.

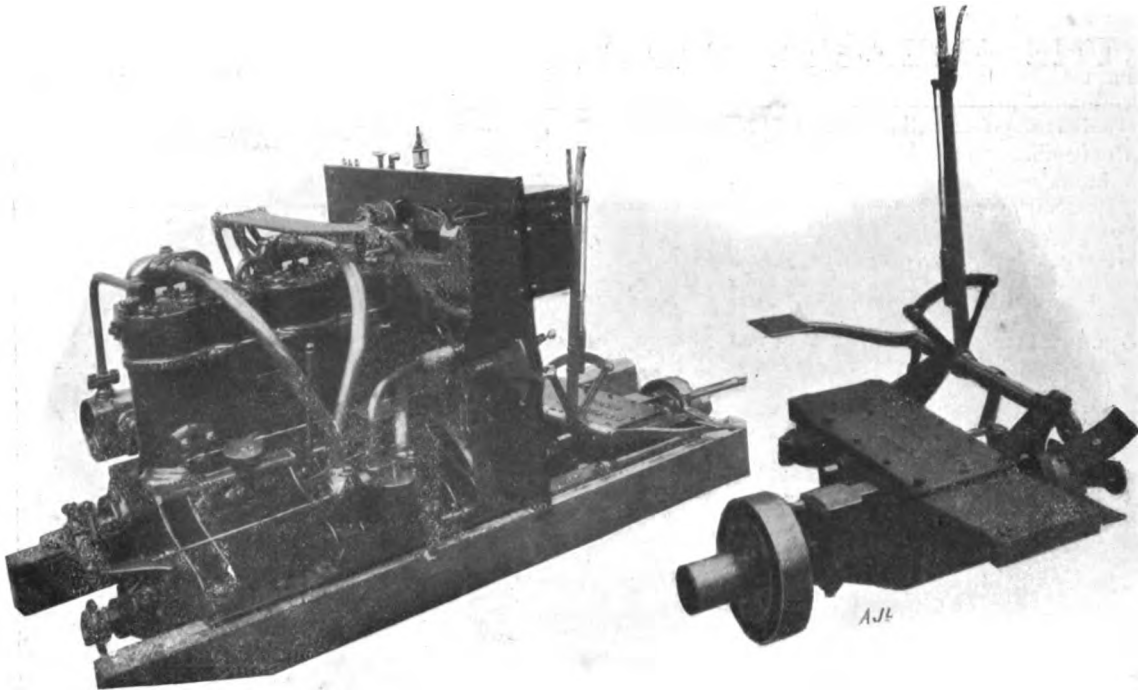


Fig. 3.—The 20-m.p. Napier Marine Motor, complete with its reversing-gear, and a larger view of the reversing-gear, separately.

duced from photographs, shows the 20-m.p. Napier marine motor, fitted with its reversing-gear and "dashboard," lying upon two wooden bearers that represent the usual foundations provided for a plant of this kind in a motor boat. Also shown separately is the reversing-gear—turned round the other way—while Fig. 4 gives a side elevation, and a plan of the entire outfit.

The engine is constructed on the usual Napier lines, with which we have already made our readers familiar, but the casting that forms the upper half of the crank-chamber, as well as the cylinder jackets, and that which forms the base of the crank-chamber, are made of cast iron instead of aluminium. The cylinders themselves consist of "liners," which are forced into place hydraulically, while the heads for each pair of cylinders are separate castings, which accommodate the valves and are water-jacketed. The inlet-valves are atmospherically operated, and are fitted above the exhaust-valves on the right side, while the two induction pipes are led across—as seen in Fig. 3—from the carburetor on the left side. The electrical apparatus for the high-tension ignition system, as also the lubricators, are fixed on the "dashboard" in the same manner as on a car, and are thus rendered particularly accessible to the driver. An automatic governor is provided, and the exhaust-box, as well as the cylinders, are water-cooled. The speed of the engine is anything between 150 and 1,200 revs. per min., which renders it conveniently flexible for its purpose.

It will be noticed that the reversing-gear is particularly compact, and that the projecting feet—by which it is fixed in place—correspond with those of the engine; there is, therefore, no difficulty in "lining up" these two parts of the mechanism relatively to one another. The whole of

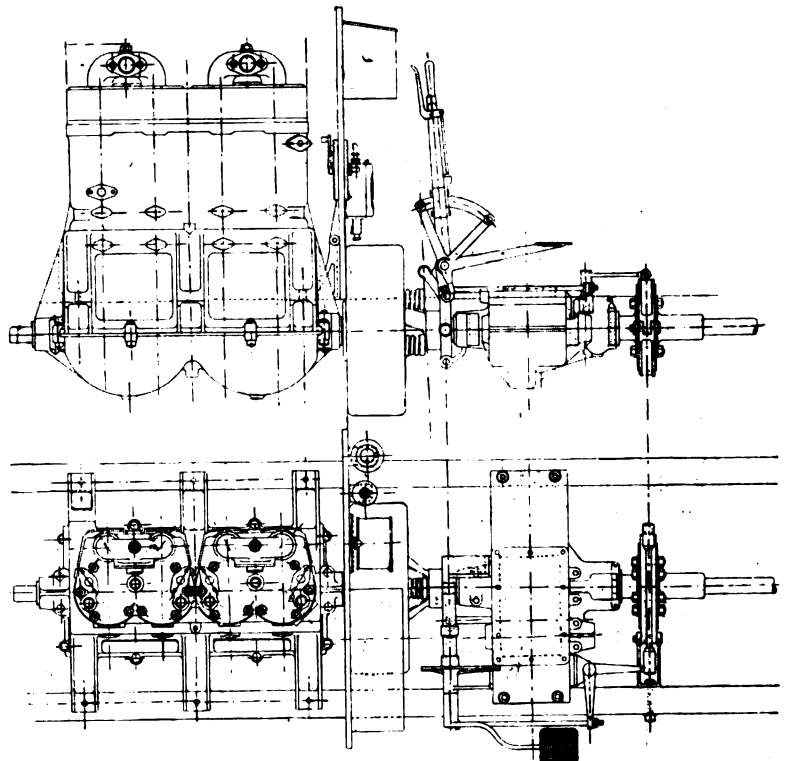


Fig. 4.—Side Elevation and Plan of the 20-m.p. Marine Motor Plant fitted to "Napier Major."

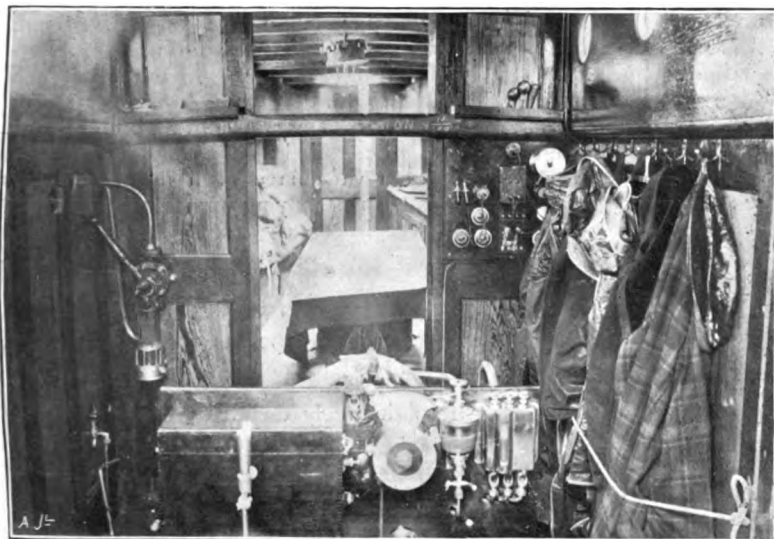


Fig. 5.—View showing the interior of the engine room and cabin on "Napier Major." At the forward end of the cabin, is a door leading to the stores lockers and pantry.

the gear is enclosed in an oil-tight box, and is, consequently, entirely protected from the corrosive action of salt water, while it will also be seen that the shape of the box is such that it occupies practically no valuable room in the boat, since the flooring can be laid down above it. The gear itself is somewhat similar to those employed on cars in which a direct-through-drive is obtained from the engine to the propeller-shaft on the "top" speed, but in this case the gear is then in its "ahead" position, and the secondary or "lay" shaft is quite idle. The "through" shaft is carried by two roller bearings, and is also fitted with a ball-thrust-bearing, while, immediately behind the gear-box, there is a band-brake, which tends to bring the propeller to rest if the clutch-pedal is depressed to the full extent of its range.

The gear is operated by the hand-lever seen in our illustrations. When moved into its astern position, it not only still keeps the through-shaft disconnected, but inter-

poses the intermediate gear wheels and the lay-shaft between its two parts. In each of its three positions the gear is therefore positive, and it is operated in conjunction with the main clutch in just the same way as is the change-speed-gear on a petrol car; it thus differs from the majority of reversing gears used for marine work, since there are no epicyclic trains, with band-brakes, and the gear is quite distinct from the clutch.

The main clutch lies inside the fly-wheel, and has metal-to-metal friction surfaces, which run in oil and are normally forced together by three springs. It is so arranged that it is disconnected by the clutch-pedal before that pedal acts upon the band-brake, the object of the band-brake being to enable the propeller-shaft to be brought to a standstill quickly when it is desired to reverse the boat at short notice. In this way the risk of damaging the gear is considerably reduced, and, further than this, the driver can make quite sure that the propeller has really ceased to revolve when the boat is standing, and the engine is still running.

The cabin is forward of the engine-room, and has sleeping accommodation for three people; in this, as in other parts of the boat, much attention has been given to the convenience of those on board, and lockers, racks, straps, &c., are fitted in every possible place, while a table and a sideboard are also provided. Considerable ingenuity has been shown in several of the fittings, and the economy of space has been well considered. The beds fold over, and form the backs of the cabin seats in the daytime, and, instead of "weather-boards," there are canvas-guards which stow away under the seats when not in use, and are held in position, when required, by lines passing up to the cabin top. Access to the cabin is normally obtained by passing through the engine-room, but a round hatch is also fitted in the cabin top, at the forward end, for use when necessary. In



A Yarrow-Napier 60-ft. river launch which followed the Oxford and Cambridge boat race on Saturday last. The hull is of steel, and is fitted with a 70-h.p. 4-cylinder Napier engine, both hull and machinery having been constructed at the Yarrow works. All the regulating levers and pedals have been brought within reach of the steersman, who is thus able to control the boat by himself. The speed of the boat over the measured mile is stated to have been 18 m.p.h. The weight of the machinery is 18 cwt., and the displacement unladen is 6½ tons, the draught being 2 ft. and the beam 7 ft.

the front end of the cabin, is a door—visible in our photograph of the interior—leading to the pantry and stores lockers. Just aft of the engine-room, is a self-draining cockpit, fitted with loose seats, and the communication between the cockpit and the engine-room may be closed, when necessary, by sliding doors. Electric light has been installed both in the cabin and the engine-room, the lamps being lit from accumulators which are

recharged by a small dynamo. The dynamo is driven, when required, by a belt from a pulley on the propeller-shaft. Fuel and lubricating oil are stowed round each side of the cockpit and in the stern, bunker capacity, sufficient for about 3,000 miles, being available.

Although in no way intended as a sailing craft, yet a 17 ft. pole-mast, and a yard have been fitted, the sail being intended merely for steadying purposes.

MOTOR BOATING.

Monaco Motor Boat Meeting.—With the inauguration of the exhibition of the boats entered for competition on Sunday last, for the second year, this important gathering of aquatic craft made a very successful start. The opening was signalled by the visit of Prince Albert of Monaco, accompanied by Prince Ferdinand of Bulgaria, who carefully examined all the chief boats on view, and scarcely passed a single craft without inspection. M. Camille Blanc, the President of the Exhibition Committee, acted as *cicerone* to the Royal party.

THE Exhibition forms the largest assembly of motor boats ever brought together. Out of 107 entries, over 60 craft were actually in place, these comprising 18 racers, 36 cruisers, 2 yachts, 3 ship's launches, and 3 fishing boats. Great Britain last year was only represented by Mr. Edge's Napier. This year, in addition to the two Napier boats, Messrs Brooke and Co. have their 30-ft. "Baby II" to uphold the prestige of this country. Such splendid speed has been made by the big Napier boat, that hopes run high that the leading prizes may be brought back to these shores by Mr. Edge's racer. The racing programme, which is a lengthy one, commences on Sunday.

Marine Motor Association.—At the spring general meeting the following members were elected to fill the annual vacancies on the council:—Messrs. A. F. Evans, S. E. Saunders, S. F. Edge, F. C. Blake, J. Lee White, B. B. Redwood, E. H. Hamilton, F. R. S. Bircham, G. R. Dunell, J. M. Gorham, and J. E. Thornycroft.

THE membership of the Association has now increased to 90, the members elected last year numbering 19.

The M.M.A. have decided to grant certificates for speed trials held by them, under the special rules, of which the following is an abstract:—(1) Trials to be run over one of the Admiralty measured miles. (2) Six consecutive runs must be made, half with and half against the tide; the runs with and against the tide to be alternative, and the mean of means to be taken as the correct speed. (3) Any stoppage will invalidate the series of runs. No slowing down during the series will be allowed, except such as is necessary for turning. (4) Applications for a certificate must be sent 14 days in advance, accompanied by fees, and full particulars of the boat. (5) Fees will be 10 guineas for the first day, and 5 guineas for each

succeeding day; travelling expenses for the M.M.A. official will be charged in addition.

It has now been definitely decided that the ordinary well-known formula for Indicated Horse Power—modified to fancy—is to be adopted for enabling the power of steam motors to be arrived at, for use in the same way as the calculated "M.P." of petrol engines, and that, in order to overcome the difficulties of ascertaining the value of the one factor, which is difficult to arrive at without making an actual test—viz., the mean effective pressure on the piston—the following assumptions will, we understand, be made, while the judicious use of the tables in Seaton Rounthwaite's Pocket-book is apparently relied upon both to simplify the actual calculations involved, and, perhaps, incidentally to prevent too public a criticism of the results obtained. The assumed data are:—That the "cut-off" is 60 per cent., the drop in pressure between the boiler and the h.p. receiver is 5 lbs., and that the back pressure is 4 lbs. absolute. Satisfactory as it is that *some* formula should at last have been adopted for permitting motor boats propelled by steam to compete with petrol launches, it is evident—as we pointed out on January 14th (p. 35) in an article dealing with this subject—that no such formula as that chosen can be found to really meet all requirements, even when leaving out of consideration the recent rapid progress in the development of "flash" steam systems and of turbines.

$$\text{M.P. (steam)} = \frac{A P R S}{33,000}$$

where:—A = Area of L.P. cylinder in sq. in.
P = Referred mean steam pressure.
R = Revs. per min.
S = Stroke in feet.

Such is now the M.M.A. "M.P." formula for steam engines which—extraordinarily incomplete and lamentably inapplicable to racing events as it is—yet bears a sufficiently close resemblance to its classic prototype to give it that dignity which—it is presumably hoped—will disarm vulgar criticism.

Coupe Récompé.—Three challenges have been entered for this Cup, the present holder of which is M. Cazes. The challengers are Gautreau Freres, Société Herald, and the Claudel Carburettor Company. The competition for the Cup will take place in Arcachon Bay, in September, at the same time as the race for the British International Cup.

THE Home Secretary has just provided a return of the so-called motor car accidents known to the Metropolitan Police since June of last year. This return alleges that there have been 1,315 accidents to property and 479 accidents to persons. We should very much like to know what

definition of a motor car accident has been adopted in compiling these statistics, as from the practice of certain branches of the daily Press, if a baby falls out of a window at one end of a street and a motor car is seen approaching at the other, this constitutes a motor car accident.

THE GORDON-BENNETT CUP RACE.



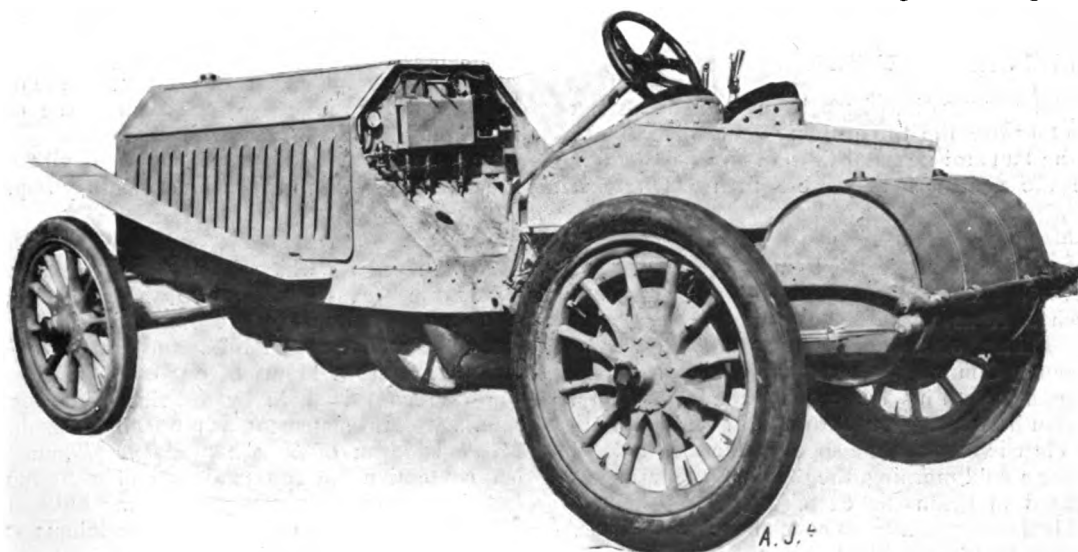
GORDON-BENNETT FRENCH ELIMINATING TRIALS.—The three Richard-Brasier cars and their drivers, which will contend over the Auvergne Circuit in the French Preliminary Trials, for the honour of representing France in the final race.

BEFORE the close of entries for the French Eliminating Trials a total of 24 cars had been reached, three Hotchkiss racers being the final trio to swell the list. The full list of cars and their probable drivers down to take part in the struggle to represent France on the Auvergne course in July next are as follows:—

- | | |
|--------------------------------------|---------------------------------|
| 1. C. G. V. (Girardot). | 13. Darracq II (Wagner). |
| 2. Panhard I (Heath). | 14. Darracq III (Touloubre). |
| 3. Panhard II (Teste). | 15. Renault I (Siz). |
| 4. Panhard III (H. Farman). | 16. Renault II (Edmond). |
| 5. Gobron (Rigolly). | 17. Renault III (Bernin). |
| 6. Richard-Brasier I (Théry). | 18. Automoto (Lapertot). |
| 7. Richard-Brasier II (Caillols). | 19. De Dietrich I (Gabriel). |
| 8. Richard-Brasier III (Stead). | 20. De Dietrich II (Rougier). |
| 9. Bayard-Clément I (A. Clément). | 21. De Dietrich III (Duray). |
| 10. Bayard-Clément II (Hanriot). | 22. Hotchkiss I (A. Four-nier). |
| 11. Bayard-Clément III (Ville-main). | 23. Hotchkiss II (Le Blon). |
| 12. Darracq I (Hémery). | 24. Hotchkiss III (Lavergne). |

offered by *L'Auto* originally as a *dot* to the Grand Prix of the A.C. de France, and upon the suppression of that race transferred as a recompense to the winner of the French Eliminating Trials. The event will probably be largely attended, specially by those interested in the racing itself, as no doubt many lessons will be learned from the performance and behaviour of the cars in this preliminary jaunt over the Cup course. No neutralised places, in all probability, will be enforced, but there will be at least two stoppages, one at Laqueille and the other at one of the bridges which are to be specially constructed. Cars will there have to slow down sufficiently to enable officials to deposit a "check" in a special box fixed on each car.

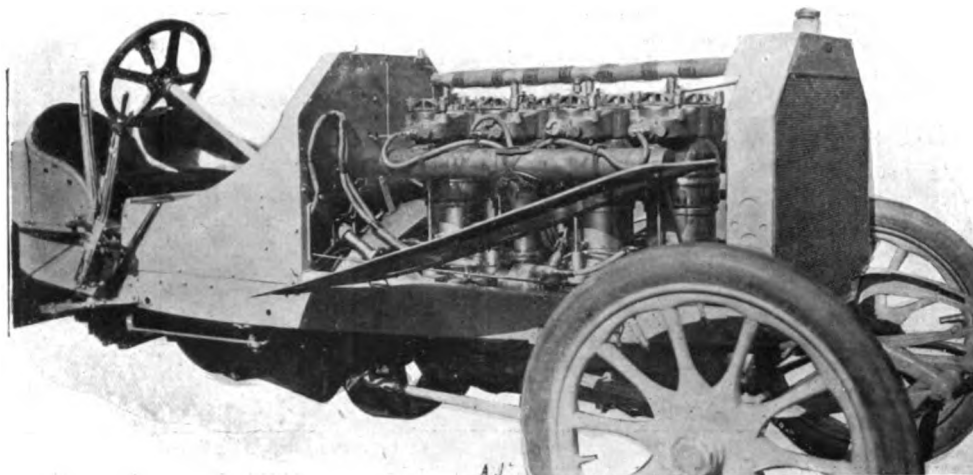
As we surmised three weeks ago, the start will be on the Laschamp plateau, where two important grand stands will be erected, that of the A.C. de France being on the left, and that of the A.C. Auvergne on the right. Already,



One of the Panhard-Levassor Gordon-Bennett Racers.

For these Eliminating Trials cash prizes are already assured of over 145,000 francs, the first prize, it will be remembered, being the now famous 100,000 francs

following the methods adopted by the Germans in connection with the race in the Taunus, separate roads for getting to the start are to be apportioned for pedestrians,



The 120-h.p. Four-cylinder Panhard-Levassor Engine.

horse-drawn vehicles, cycles, and automobiles, so that there will be no fear of clashing and complications in arriving at this main point of attraction.

The French Minister of War has announced his intention to accept the invitation of the French Club to be present at the race in July.

Considerable activity is being shown by the Auvergne A.C., with the object of making the meeting, commencing with the Eliminating Trials on June 16th, and winding up with the big race on July 5th, a big success throughout, thereby justifying the selection of the Auvergne circuit by those in authority. So as to maintain the interest unabated, various events are to be arranged by the club for each Sunday. These will include (1) a contest for a mile with a standing start, and for the flying kilometre on the Riom Road; (2) hill-climbing contest at La Baraque; (3) an automobile *corso fleuri*; and (4) an endurance competition for tourist cars.

THE PANHARD-LEVASSOR RACERS.

A FEW important alterations have been made since last year, but otherwise the three racing cars which are to represent the Panhard-Levassor firm in the Eliminating Trials are the same as they were then. Our first



To what an extent the electric tramcar can be a public danger was well illustrated at Southwark County Court recently, when Henry Rayner, conductor in the service of Messrs. Tilling, obtained £50 damages against the London County Council for personal injuries received. The conductor was on his 'bus crossing the lines of tram near the Southwark Bridge Road, when suddenly up dashed an electric tramcar at a speed well above its legal limit. Being a cold morning, the driver of the tram was busily engaged in gymnastic exercises to keep himself warm, and had consequently no control over the vehicle, with the result that he smashed into the 'bus, throwing the conductor into the gutter, breaking his collarbone, and injuring his head. It was mighty fortunate for the gymnastic tram driver that his victim did not lose his life, as the least that could have happened to him in that case would have been trial for manslaughter.

illustration shows one of them ready for the roads, and the other gives a view of the powerful 4-cylinder engine from the inlet-valve and ignition side. As will be seen, a honeycomb radiator has been substituted for that of last year, and the large cylindrical petrol tank is fitted between the side-members of the pressed-steel frame, quite at the rear. The front and rear wheels have respectively tyres of $32\frac{1}{2}$ in. (820 mm.) and $34\frac{1}{2}$ in. (880 mm.) diameter.

The transmission gear, from the engine to the live-rear-axle, consists of a multiple-disc main

clutch, of a change-speed gear having four forward speeds with a "direct-drive" on top, and of a propeller-shaft with bevel gearing. It is so proportioned that the speed of the car on the top gear is equivalent to about 90 miles per hour.

The engine is stated to give about 120-h.p. at 1,100 revs. per min., and it is of that type in which the cylinders are made of steel, and each of them has a copper water-jacket. The bore, as well as the stroke, is 170 mm., and the interchangeable inlet- and exhaust-valves are placed on opposite sides of the engine. One of the new features this year is that the water pressure in the circulating-water system is made use of to act as an automatic governor controlling the throttle-valve. The circulating-pump is gear-driven, and the normal engine speed can be varied from about 300 revs. per min. up to the maximum. As will be seen from our second illustration, the high-tension ignition-plugs are fitted horizontally into the inlet-valve-chambers; they are employed in conjunction with a high-tension magneto that lies beneath the bonnet, in front, on the other side. For lubricating the engine by hand from the dashboard, four independent levers project from the lubricator-fitting, thus enabling an ample supply of oil to be at all times forced down to the cylinders as they require it.



IN the articles which have been appearing in *The Times* recently, in respect to the protection of the British motor industry by the imposition of a duty on foreign-imported automobiles and parts, it has been claimed in the columns of our contemporary that the world's record is held by a British car for reliable running. This statement has now been challenged by M. Paul Meyan, of *La France Automobile*, and to justify his contention he has made an offer to run his De Dietrich car against any 4-seated car built entirely in Great Britain, over a distance of 5,000 kiloms. in France, the daily distance to be 350 to 400 kiloms. He is willing to back his challenge with 10,000 francs. This is a sporting offer which we should like to see taken up, provided the supervision is strict, and upon the lines recognised on this side of the Channel.

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THE 1905 PRUNEL PETROL CARS.

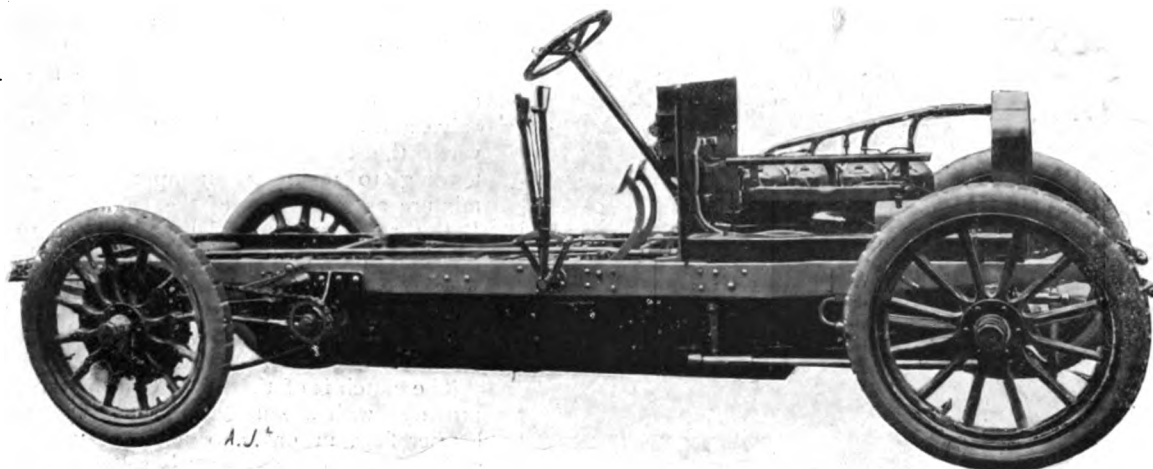


Fig. 1.—Side view of the 24-30-h.p. Prunel Chassis, showing the inclined water-pipe to the radiator.

ALTHOUGH there are few radical departures from orthodox design in the new Prunel models, yet the cars turned out by the Prunel Company, of Puteaux—for which Messrs. Delamotte and Foster have the sole English agency—are interesting examples of up-to-date and substantial construction, and they are, moreover, moderate in price. Four distinct types are comprised in the list of models for this year, and of these two have twin-cylinder engines and two have 4-cylinder engines. The 4-cylinder engines, however, are each constructed from two twin-cylinder models, so that, with respect to the bore and stroke, there are but two types of engine, viz., the 10-12-h.p. and 16-20-h.p., which have a bore and stroke of 95 and 125 mm. respectively, and the 12-14-h.p. and 24-30-h.p., which have a bore and stroke of 110 by 130 mm. respectively. The power of the two larger models is

estimated at 900 r.p.m., while that of the smaller engines is estimated at 1,000 r.p.m. As the chassis of all the models are similar in general design, the photographs and description which we are able to give of the 24-30-h.p. car will apply, in the main, to the smaller vehicles also.

The chassis, seen from the side and from above in Figs. 1 and 2, respectively, is of the chain-driven type, is fitted with a 4-cylinder engine, and has a gear-box of the sliding spur-wheel type, giving four forward speeds and a reverse. The frame is of pressed steel, having a tapering cross-section, and is carried on semi-elliptic side-springs, those at the rear lying outside, instead of beneath, the frame. The rear springs, which are very long, are carried by shackles at both ends, and adjustable radius-rods tie the axle to the frame. The principal cross-members are of channel section, and one of them

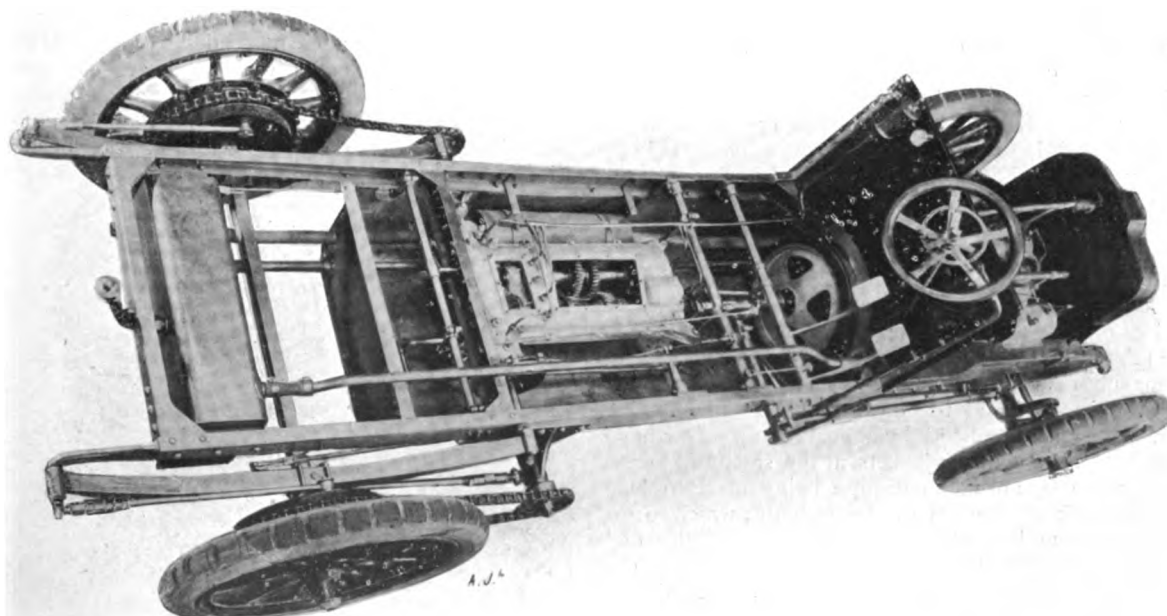


Fig. 2.—View from above of the 24-30-h.p. Prunel Chassis, showing the method of suspending the gear-box from the transverse members of the frame.

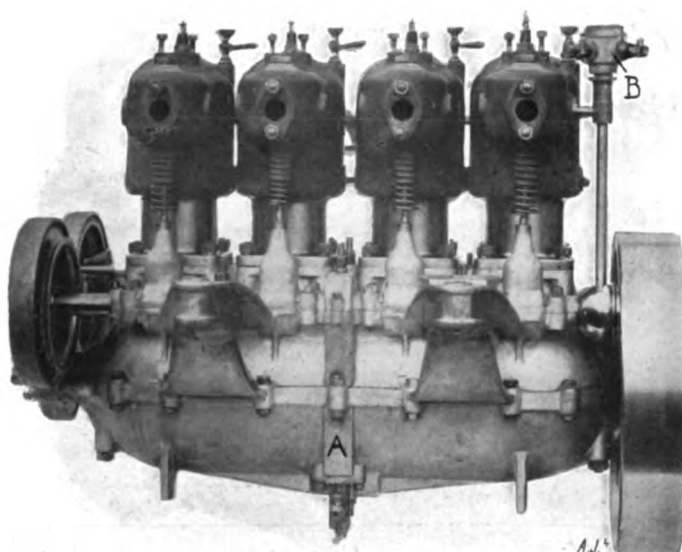


Fig. 3.—View of the four-cylinder 24-30-h.p. engine, which is fitted to the Prunel Chassis, showing the positions of the lubricating oil-pump, A, and of the gear-driven commutator, B.

is, as will be seen in Figs. 2 and 4, arched to pass immediately above the flywheel. In addition to these channel cross-members, however, there are also two tubular members, and, while one of them is used to carry the foot pedals, the other carries the vertical bolts which support the front end of the gear-box. The side members of the main frame are narrowed in front of the dash in order to secure a wide steering lock. The axles are both solid forgings, having an I cross section, that at the rear being straight, while that in front is bent downward at the centre. The steering gear is of the worm and segment type, and the connections are of a very substantial size; the tie-bar lies in front, and the forks carrying the steering-heads form part of the forged axle.

The engine, shown separately in Fig. 3, is carried by a short underframe, but is, in addition, steadied by a cross-rod which connects the top of the crank-chamber to the side-members of the main-frame. The four cylinders are cast separately, and the interchangeable, mechanically-operated valves are arranged symmetrically on either side. Neat inspection-covers are fitted above the valves and these are easily removable, being held in place by dogs. The gear-wheels driving the cam-shafts are partly enclosed by a separate casing in front of the engine. A gear-driven high-tension magneto is fixed on the right of the engine, but in addition to the magneto, a battery of accumulators is also provided, and the commutator, B, for this system, is mounted, in an accessible position, on the top of a vertical shaft, which is gear-driven from the rear end of the exhaust-valve cam-shaft. The magneto is of the Eisemann type, and the induction-coil, C, is fitted behind the dash (Fig. 4). The cooling water, which is circulated by a gear-driven centrifugal pump, enters the cylinder-jackets at the side, and leaves them at the top, an inclined pipe being used to lead the water back to the top of the radiator, which forms the front of the bonnet. The radiator is of the coil type and is constructed of finned tubes, which are enclosed in a brass case, a separate water-tank being fitted at the back of the chassis.

On the centre of the inlet-valve cam-shaft is an eccentric, which operates a small plunger-pump, A, in the

crank-case. This pump, the position of which is visible in Fig. 3, is used for circulating the oil through all the main bearings of the engine. The carburettor is of the ordinary float-feed jet type, and the petrol-tank is placed under the driver's seat. Auxiliary-air ports, arranged in the mixing-chamber casting, are controlled by the throttle-valve, and they admit cold air to the induction-pipe when the throttle-valve is opened wider, thus tending to maintain an approximately correct mixture as the power of the engine is increased. Both throttle and timing-levers are fitted above the steering-wheel, and the quadrant over which they work is perforated instead of being notched in the usual way. No governor is provided, as a rule, although provision is made for one to be fitted and inter-connected with the throttle, when required.

The clutch is of the ordinary cone type, and is provided with a number of flat springs under its leather face, in order to make it "soft" in its action. The clutch-spring is self-contained, and imposes no end thrust on the shafts when the clutch is engaged. In the chassis, from which our photographs were taken, a short flanged shaft is interposed between the clutch and the gear-box, but in all future models a cardan shaft is being fitted instead. The gear-box is of the ordinary sliding spur-wheel type, the lay-shaft lying to one side of the through-shaft. Four speeds and a reverse are provided, the top speed giving a direct drive from the engine to the differential countershaft. The gear-box itself is carried by four vertical bolts, which hang from two of the transverse members of the main frame, and it is, therefore, readily removable from below. Plain bearings are fitted throughout the gear-box, and they are lubricated from a greaser on the dash. The ends of the differential countershafts carrying the chain sprockets, however, run on ball bearings, as do the hubs of the road wheels. A metal sheet, which is fitted beneath the chassis, extends from the front of the engine to well behind the gear-box, so that the entire transmission mechanism is well protected from mud and dust.

Internal expanding brakes are fitted to the rear wheels, and these are operated by a side-lever. They are compensated by means of a wire cable, and are anchored, by adjustable rods, to the dumb irons of the rear springs. A band-brake is fitted on the differential-countershaft, and is operated by a foot-pedal through a Bowden wire.

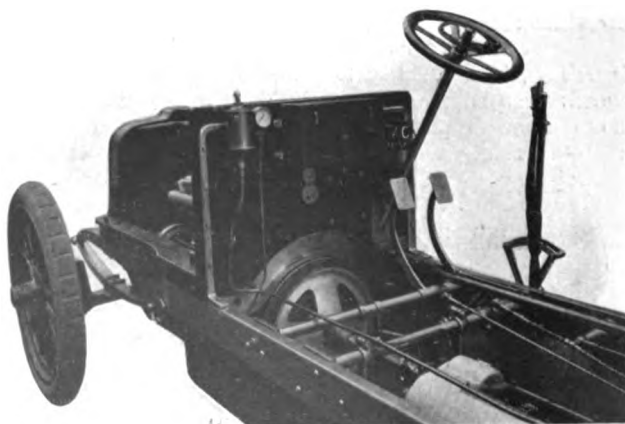


Fig. 4.—View of the dash, showing the position of the induction coil, C, for the high-tension magneto.

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THE 1905 HOTCHKISS CARS.—PART IV.

A LUBRICATING oil-tank, D, is mounted on the dash under the bonnet, but the sight-feed is arranged in full view of the driver, as can be seen in Fig. 12. The position of the tank, D, is visible in Figs. 5 and 6, but a larger view of it is given in Fig. 13, and in this the small plunger-pump, D³, can also be seen. The pump, D³, is for the purpose of supplying oil to the sight-feed fitting, and it is driven—through the rock-lever, D⁴—from the front end of the inlet-valve cam-shaft by an eccentric which operates the rod, D¹. The fulcrum for the rock-lever, D⁴, is, it will be noticed, carried in a slotted

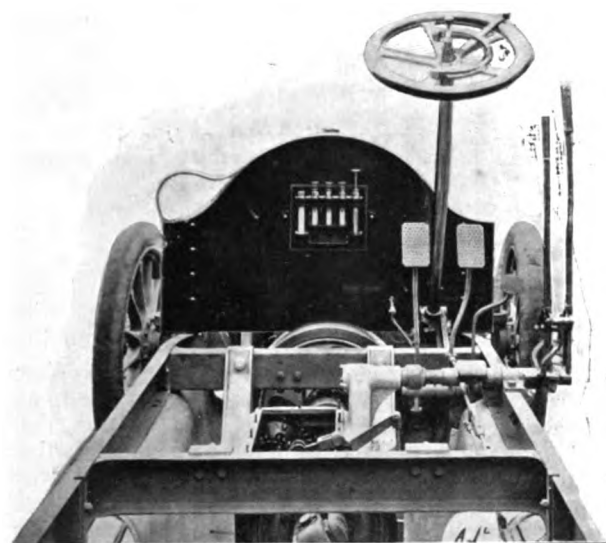


Fig. 12.—View showing the dashboard and the controlling levers and pedals on the 17-25-h.p. Hotchkiss Car.

bracket, D⁵, and, being adjustable, it thus enables the rod, D¹, to be lined up accurately.

The clutch is of the ordinary cone type, and is self-contained with the spring, so that no end thrusts are imposed on the shafts while the clutch is engaged.

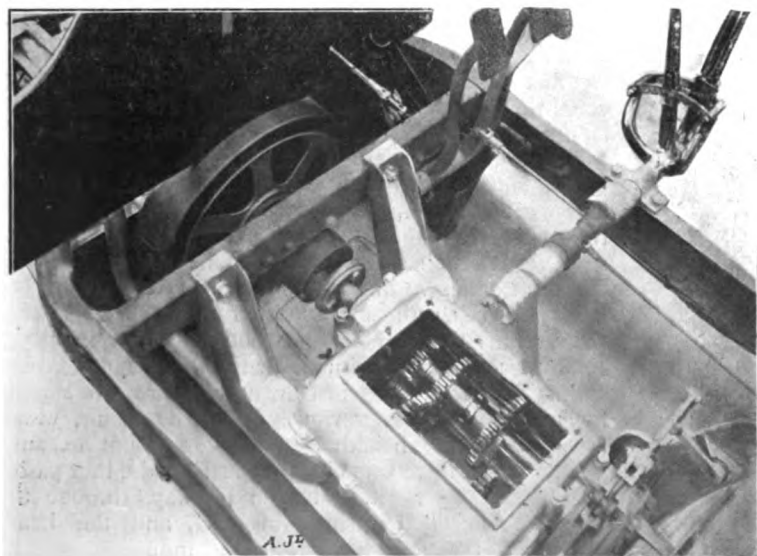


Fig. 14.—View of the gear-box on the 17-25-h.p. Hotchkiss Car, showing the arrangement of the operating shaft.

The gear-box, which provides four forward speeds and a reverse, is carried by four longitudinal feet, which rest on two of the transverse cross-members of the main frame. All the gear-wheels and shafts are of nickel steel, the shafts are mounted on ball-bearings—as

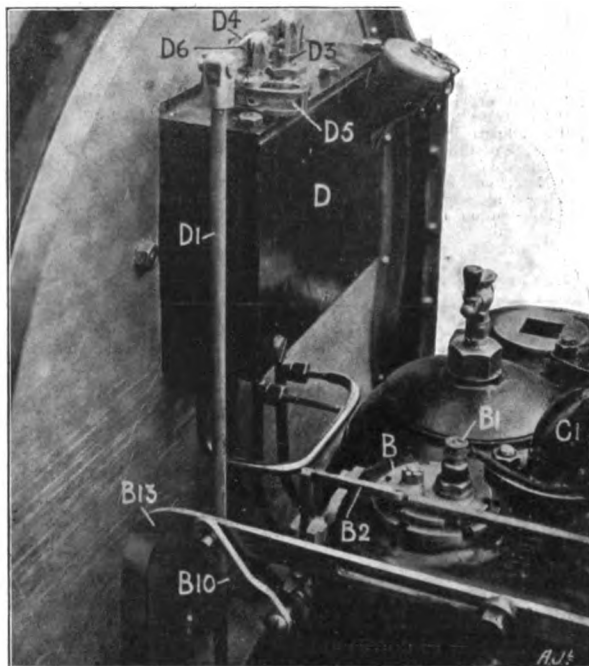


Fig. 13.—View showing the front of the dash and the position of the lubricating-oil tank, D, together with the oil-pump, D³.

is all the transmission mechanism—and the key-ways for the sliding member on the driving-shaft are milled out of the solid. The sliding member is operated by a side lever, which is connected through the top of the gear-box to a toothed quadrant intermeshing with the rack which carries the striking-fork. By this arrangement, which is shown in Fig. 14, the bush for the operating-shaft is placed in such a position that grease cannot well find its way out through it. Oil-tight caps are also fitted to the ends of the lay-shaft bearings for the same purpose. Universal joints are provided at each end of the propeller-shaft, and the differential casing is, as will be seen from Fig. 15, made with a horizontal joint, so that the top half can be easily removed for the purpose of inspection. The wheels are carried by ball bearings on extensions of the axle casing, and the drive is transmitted to the frame through the rear springs. Internal expanding brakes are fitted to the rear wheels; these are operated by a side lever, and are compensated by a wire cable in the usual way. The foot-brake acts on a drum situated immediately behind the gear-box, and the brake-rods are provided with very neat adjustment nuts, which are so made as to provide their own lock-

ing device and "tommy-bar"—a refinement which, by reducing the trouble of adjustment, increases the chance of the brakes being always in order.

Table of Reference Letters for the 1905 Hotchkiss Cars.

A	Carburettor float-feed-chamber.	B ³	Hinged heel on B ⁴ .
A ¹	Mixing chamber casting.	B ⁴	Tappet.
A ²	Jet.	B ⁵	Striking arm.
A ³	Cold air inlet.	B ⁶	Spring, controlling B ⁷ .
A ⁴	Warm air inlet.	B ⁷	Timing spindle.
A ⁵	Induction pipe fitting.	B ⁸	Timing lever.
A ⁶	Throttle-valve.	B ⁹	Timing adjustment wheel.
A ⁷	Throttle-lever.	B ¹⁰	Catch for holding B ¹¹ .
A ⁸	Auxiliary air inlet.	B ¹¹	Timing bar, operating B ¹⁰ .
A ⁹	Small ports in casting, A ¹ .	B ¹²	Spring for B ³ .
A ¹⁰	Large port in casting, A ¹ .	B ¹³	Circulating pump.
A ¹¹	Small ports in throttle-valve.	B ¹⁴	Cooling water pipes.
A ¹²	Large port in throttle-valve.	B ¹⁵	Lubricating tank.
A ¹³	Passage from A ⁴ to jet.	B ¹⁶	Lubricating pump spindle.
A ¹⁴	Notches cut in A ⁴ .	B ¹⁷	Eccentric operating D ¹ .
B	Low-tension igniter plug fitting.	B ¹⁸	Pump plunger.
B ¹	Low-tension igniter live terminal.	B ¹⁹	Fulcrum.
B ²	Rock-lever.	B ²⁰	Adjustable bracket for D ⁴ .
B ³	Bracket carrying striking gear.	B ²¹	Rock lever.
B ⁴	Push rod.	B ²²	Magneto.
		B ²³	Distributing board.

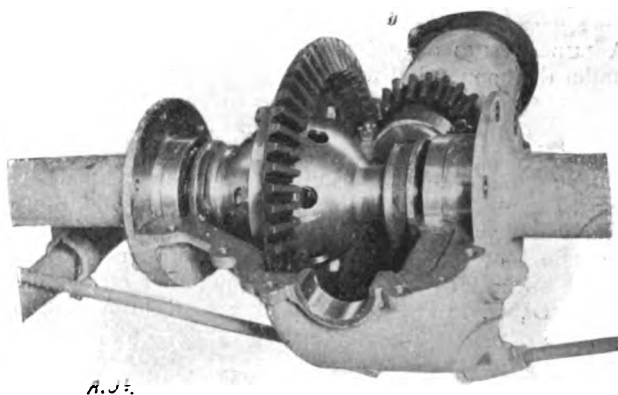


Fig. 15.—View of the differential on the 17-25-h.p. Hotchkiss Car, showing the horizontal joint in the casing.

THE NEW 35-H.P. BROOKE CAR.

(Continued from p. 417.)

THE upper portion of each vertical rod, C, is fitted with a guide, D, that is secured in place above the cylinder-casting by the pair of studs, D¹, and, at the extreme upper end, there is a specially shaped lever-arm, C², fixed rigidly to the rod. The lever-arm, C², is wedge shaped, to correspond with a wedge-shaped portion, A¹, of the rocking-arm, A¹, of the igniter, and the relative positions of these two wedge-shaped portions (C² and A¹), is such that, when the former descends rapidly, it causes the igniter-spindle to rock round about its axis—producing a quick "break" between the contact-points inside the valve-chamber. As the rod, C, is moved upward again, the adjustable spring, A³, on the igniter brings the internal contact-points together once more, ready for the descending rod to separate them under the action of the spring, C¹, and of the wedges. Each igniter, A, is held in place by a pair of studs, A⁴, and can be removed without disturbing any of the operating mechanism. It will also be noticed that the rod, C, is prevented from rocking about its own axis—as it tends to do when the two wedge-shaped arms, C²

and A², come into contact with one another—by giving the rod a square cross section at its upper end, and providing a square hole for it in the guide, D.

The time of ignition is varied on the 35-h.p. car by a small lever fitted on the dashboard, and the usual switch is provided for short-circuiting the magneto, and thereby cutting off the current when required. The wires leading to each of the igniters are connected up to a distributor-board fixed to the engine, so that either plug can be cut out of circuit readily, for testing, when necessary. The high-tension system, when fitted to these engines as an additional system, is of that type in which a single-trembler-coil is employed in conjunction with a high-tension distributor; the high-tension plugs are then, as we have already said, screwed into the walls of the inlet-valve chambers.

The Carburettor.

The carburettor now employed is very similar to that of which we gave a fully illustrated description on October 31st last, but has now been modified to a certain extent, and is water-jacketed. Its construction is shown sectionally in Fig. 8, which corresponds with Fig. 1 of the previous article referred to.

The chief alteration that has been made, is that the automatic valve, K, which admits auxiliary air through the ports, K³—and maintains an approximately constant degree of suction in the mixing-chamber—is no longer fitted above the larger of the two spray-jets, but is placed so that the air admitted by it merely dilutes the richness of the already-formed mixture. A piston, K¹, has also been substituted for the diaphragm, and the spring, K², that acts against the atmospheric pressure, is longer than it was previously. The main air, which is led from the neighbourhood of the hot exhaust-pipe, enters the mixing-chamber at F, and either passes across the larger jet, only, on its way, through the governor controlled throttle-valve, G, and the hand-controlled throttle-valve, H, to the induction-pipe, E, or it goes around the restricted orifice surrounding the smaller jet, direct to the throttle-valve, H. The hand-

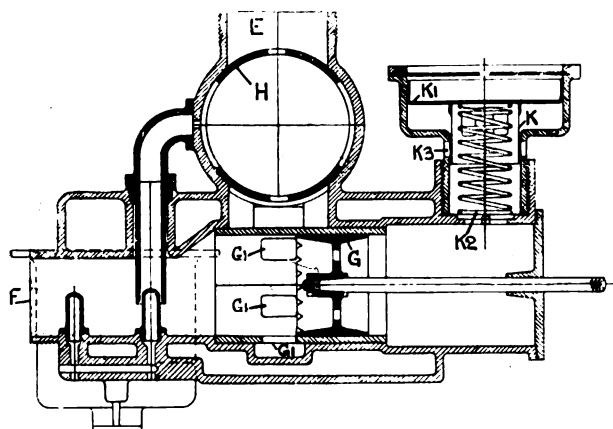


Fig. 8.—The Brooke "Automatic" Carburettor. Section through the mixing-chamber, the spray jets, the throttle-valves, and the atmospheric auxiliary-air-valve.

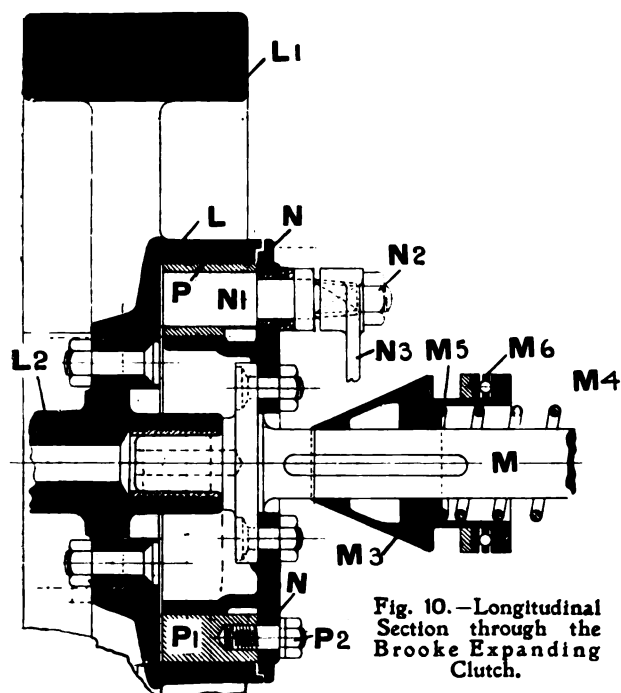


Fig. 10.—Longitudinal Section through the Brooke Expanding Clutch.

controlled valve, H, is connected with the single hand-lever that is fitted above the steering-wheel, in such a way that the valve, H, is gradually opened to its full extent as the lever is moved over the first half of its range; the valve, H, then remains wide open, while the lever is moved over the second portion of its range, this further movement acting upon the governor, and, therefore—although indirectly—upon the other throttle-valve, G. The connection between the hand-lever and the governor is such that a spring, tending to act against the governor, is gradually increased in strength, and thus the speed at which the governor is able to close the valve, G, becomes greater, as is the case with an ordinary "accelerator" upon a car.

It will be noticed that the front edge of the throttle-valve, G, is serrated, so that the ports, G', are only very gradually closed as the valve approaches the end of its range of travel.

It will be remembered that one of the special features of the carburettor is that provision is made for enabling the level of the petrol in the float-feed-chamber to be adjusted readily, so that the actual richness of the mixture can be varied to suit the engine. It should perhaps be pointed out, however, that this adjustment enables a very wide range to be made, and that it should, therefore, be looked upon by the user more as a convenience to enable the maker to obtain the best results, initially, than as an ordinary adjustment to be "played with." **INDEX**

The Main Clutch.

The clutch, which is of the internal expanding type, with metal friction surfaces, and runs in oil, is shown in Figs. 9 and 10. In the former illustration, the inner mem-

ber, fitted on its shaft, is seen alone, from the front end and from the side, but the sectional drawing in the other illustration renders clear its position inside the external "driving" member. Cast with the flywheel, is the clutch-drum, L, the arms between it and the flywheel rim, L', constituting fan blades. This casting is bolted, as usual, by a flange-joint, to the crank-shaft, L², which is hollow throughout its entire length. The clutch-shaft, M, which carries the inner, or "driven," member, is supported at its front end by a spigot bearing in the end of the crank-shaft, and it is, at its other end, coupled up (as seen in Fig. 9) with the flange, M¹, by which it is connected with the change-speed-gear. In order to render the shaft, M, self-aligning, the special form of flexible-coupling shown in the illustration is employed, the shaft being divided at this point, and the coupling introduced between the two adjacent ends. The coupling consists of a pair of star-shaped steel plates, M², which have two of their opposite projecting lugs bolted to the one shaft, and the other two opposite lugs bolted to the other. The springiness of the plates renders this device equivalent to a universal joint.

Bolted to the shaft, M, is the casting, N, which serves the double duty of carrying the expanding clutch-ring, P, and of forming a cover for the clutch-drum. The ring, P, normally rests upon the cylindrical inner portion of the casting, N, and it is compelled to revolve with it because the ring has an internally-projecting portion, P¹, that rides in a corresponding slot (as seen in Fig. 9), and also because it is secured to the casting, N, by the stud, P²—as seen in Fig. 10. Immediately opposite to the projection, P¹, the cast-iron ring, P, is split right through, and it has an oval-shaped hole formed through the thickened metal—half on one side and half on the other, of the split. Fitting into this oval hole, is a similarly shaped cam, N¹, which is carried by a short shaft, N², as seen in Fig. 10. The shaft, N², projects out through the casting, N (as seen in both illustrations), and is fitted with a lever-arm, N³, at its outer end. By this arrangement, a sliding-cone, M³, on the clutch-shaft, M, can be made to cause the clutch-ring, P, to expand so that it grips the internal-drum, L, or can be made to allow the ring to contract under the influence of the internal-spring, P³—which normally tends to tighten it about the casting, N. The lever-arm, N³, has a small roller, N⁴, fitted to it in such a way that the roller rides on the face of the cone, M³. The cone, when normally forced inwards—as it is by the external clutch-spring, M⁴—thus rocks the short shaft, N², about its axis, and causes the cam, N¹, to force apart the two ends of the split ring, P.

(To be continued.)

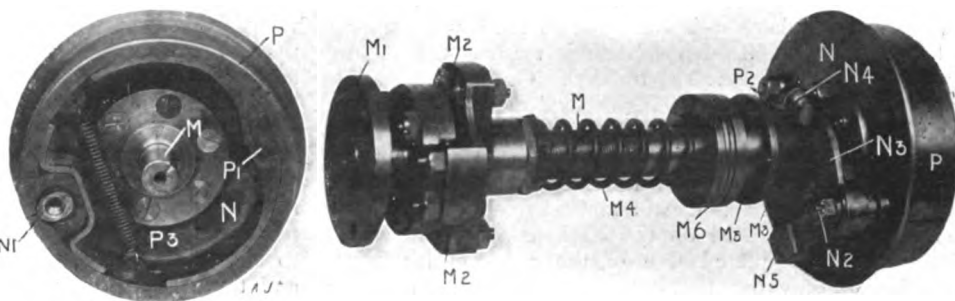


Fig. 9.—The Brooke Internal Expanding Friction Clutch. Front and side views of the inner member fitted to the clutch-shaft.

THE THORNYCROFT LURRIES, OMNIBUSES, AND VANS.—PART IV.

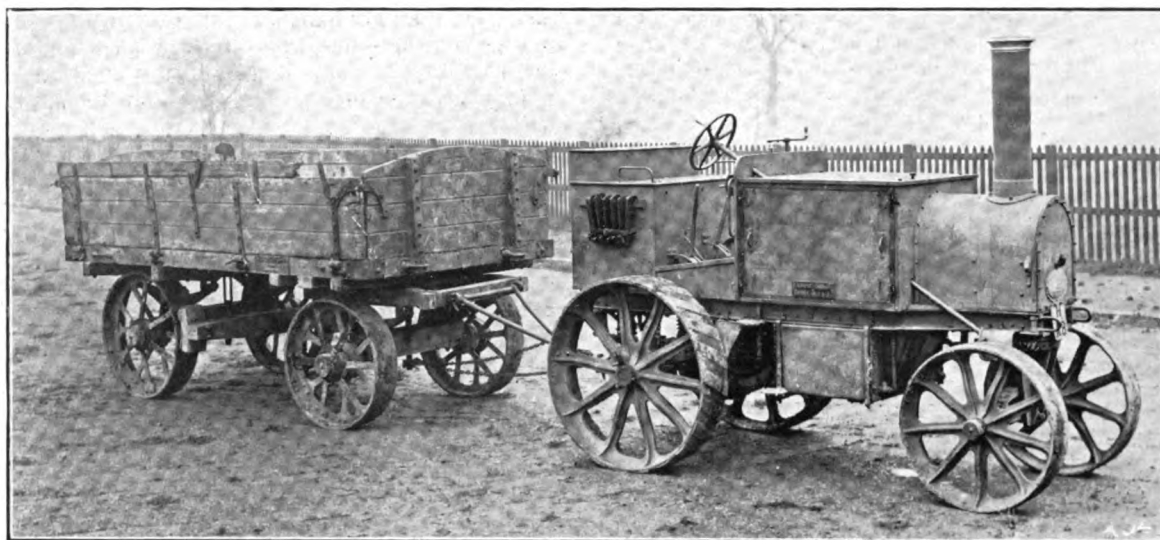


Fig. 6.—View of the Thornycroft 5-ton Motor Tractor, which has a twin-cylinder engine, and uses either petrol or paraffin as fuel.

THE "spring-drive" is used on all the Thornycroft steam luries, and on the petrol omnibuses, though not on the tractor or on the military lurry, of which separate descriptions are about to follow. Referring to Fig. 5, it will be seen that the hub, A^3 , of the road wheel is mounted freely upon the end of the live-axle, A , and that, instead of being driven direct by it, there are two multiple-leaf springs, A^1 , for the purpose. These springs are securely bolted to the axle, A , and transmit the drive to the felloe of the wheel—pressing up against the projecting brackets, A^2 . By this construction, the axle, A , which is driven by the engine, can turn about its axis through an appreciable angle before the road wheel is compelled to revolve with it. Owing to the comparatively low speed of the axle in relationship to the engine, this represents a considerable amount of movement of the crank-shaft, during which time the pressure on the springs, A^1 , gradually increases, and the load is, therefore, taken without any sudden shock. The device is not only simple, but has proved extremely effective during several years of use in practice, and it is just one of those important details which is apt to have such a far-reaching effect on the commercial success of an industrial car.

The 5-Ton Motor Tractor.

This very handy little vehicle has been designed for use in those cases where it is desirable to employ a tractor which is quite independent of, and is readily detachable from, the load which it has to haul. On ordinary hard roads, it is capable of pulling a load of $6\frac{1}{2}$ tons over gradients of up to about 1 in 8, and, for use on soft ground, "spuds" are provided for attachment to the driving-wheels, so that it can extricate itself, without difficulty. To render it still more useful, however, a winding-drum is fitted on the back axle, and the axle itself can be rendered free of the road-wheels; the engine then only operates the drum, and the drum can be made to wind up a cable that may be anchored at its other end to some stationary object. The winding-gear is, of course, available, also, for enabling the tractor, when

stationary, to haul its load over very heavy ground. The tractor weighs about $4\frac{1}{2}$ tons, of which about $3\frac{1}{2}$ tons is carried by the driving-wheels, and the power available from the twin-cylinder engine is about 30-b.h.p. The overall dimensions are 12 ft. 6 ins., by 6 ft. 4 ins., and the driving-wheels are 4 ft. 3 ins. in diameter, by 12 ins. wide; the lowest point of the mechanism is 12 ins. clear of the ground, and thus the vehicle is useful either on very rough ground, or could pass through a considerable depth of water without trouble. There are three speeds provided by the gear, and the reversing mechanism is so arranged that all three are available in either direction; they represent $1\frac{1}{2}$, 4 and 8 miles per hour respectively, at normal engine speed.

The appearance of this machine, attached to a trailer, is shown in Fig. 6, and its external resemblance to a steam traction engine will there be seen at a glance. The portion that resembles a boiler in front, consists in reality of a square casing which forms the "engine-house," and has detachable sides, while the other chamber in front of it contains a surface cooler for the circulating water. Air is drawn through the condenser, and up the funnel, by the injector-action of the exhaust-gases, and is also forced through it by a fan formed in the engine flywheel. Fig. 7 shows the construction of the front axle, and its turntable, and Figs. 8 and 9 are views looking into the engine-house from the left and the right sides, respectively—the side doors having been taken off.

The engine is fixed to the strong channel frame almost midway between the two axles, with the crank-shaft lying longitudinally. The frame is mounted on side-springs above the "live"-rear-axle, and on a single inverted transverse spring over the front axle. The front axle is pivoted on a horizontal pin at its centre, to allow the wheels to ride over very rough ground, and there is a kind of horn-plate beneath the turntable, to restrain the axle from moving in any but a vertical plane.

(To be continued.)

THE WOLSELEY INDUSTRIAL VEHICLES.

(Continued from p. 419.)

ALTHOUGH the dimensions already given refer more especially to the chassis for single-deck 'buses, yet they are for the most part also applicable to the double-decker, of which we give an illustration herewith. The only difference is in the wheel-base, which is 10 ft. 6 in., and in the available length behind the dash, which is 15 ft. 6 in.

The steering-gear, which is of the worm-and-sector type, is fixed to the front member of the frame, as seen in Fig. 3, and is connected with the steering-head on the "near" side by a rod that lies transversely. Fig. 3 is a view of a chassis that was built with a channel-steel frame, and is in a few other minor respects different from those that are now being supplied, but it enables certain of the parts, which are invisible in Figs. 1 and 2, to be seen, and will, therefore, be found useful for reference. In it, for instance, the top of the crank-camber, A, is

only. On the right hand end, is fixed the flywheel, A¹, and the sprocket-wheel from which the power is taken to the main clutch, and, on the other projecting end, is fixed a pulley for driving the fans. These fans form a part of the combined radiator and tank, A⁵, which bridges across the frame, from side to side, and partly forms the driver's seat. The two sides are fitted with horizontal finned tubes, making them resemble panels when the vehicle is completed, and the fans lie just inside them—being fixed to a transverse shaft which is driven by a belt. The water is, as usual, circulated by a pump that forms a part of the engine itself, though, owing to the position of the water tank, natural circulation would take place without it.

Fitted in front of the dashboard, is the 12-gallon petrol tank, A⁶, and behind it is fixed the timing lever, A⁸—that is connected with the commutator, A⁹,—and the



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The Wolseley Double-deck Petrol 'Bus, which has a four-cylinder 24-h.p. horizontal engine, and accommodates 36 passengers in all—16 inside, 18 on top, and 2 beside the driver.

removed to expose to view the two connecting-rods; and the combined water-tank and radiator, A⁵, is not placed in position above the engine.

Referring to Figs. 2 and 3, it will be seen that the engine is fixed with the cylinder-heads, A², projecting forward, and that the crank-chamber casting, A—which also forms the water-jacket around the cylinder-liners—is bolted to two cross-members of the frame. The carburettor, A³, is secured to the induction-pipe, which holds down the two atmospheric inlet-valves, and the throttle-valve is operated by the lever, A⁴, on the steering pillar. This lever is now arranged as seen in Fig. 1, to move over an unusually long quadrant that is placed vertically. The crank-shaft has its two crank-pins in line with one another, with a counter-weight between them, precisely as on the new 8-h.p. pleasure car that we described recently, so that the shaft is carried by two bearings

multiple-feed lubricator, from which the oil flows by gravity to the engine. The average fuel consumption, under ordinary conditions, is about a gallon and a quarter per hour, so that the 'bus is capable of doing an ordinary day's work without replenishing the tank. As will be seen in most of the illustrations, the exhaust-box, A⁷, is fixed behind the gear-box, and there is a single pipe leading to it from the two cylinders.

The transmission-gear is of much the same design as that already referred to in connection with the military transport wagon, and is secured in place in the frame with a three point suspension—as on the latest touring vehicles. The gear-box, B, has an intermediate second-motion-shaft, B¹, between the first-motion-shaft and the differential countershaft, so that the speed of the latter is considerably lower than it otherwise would be.

(To be continued.)

INDEX

THE LATEST CLARKSON STEAM 'BUSES.

(Continued from page 420.)

BOTH the tanks, D and E, have gauge glasses, and neither of them is subjected to pressure. Arranged inside the top of the water-tank, is a filter, F¹, through which the condensed water is returned to it. In Fig. 2, will also be seen the pressure-tank, E³, into which

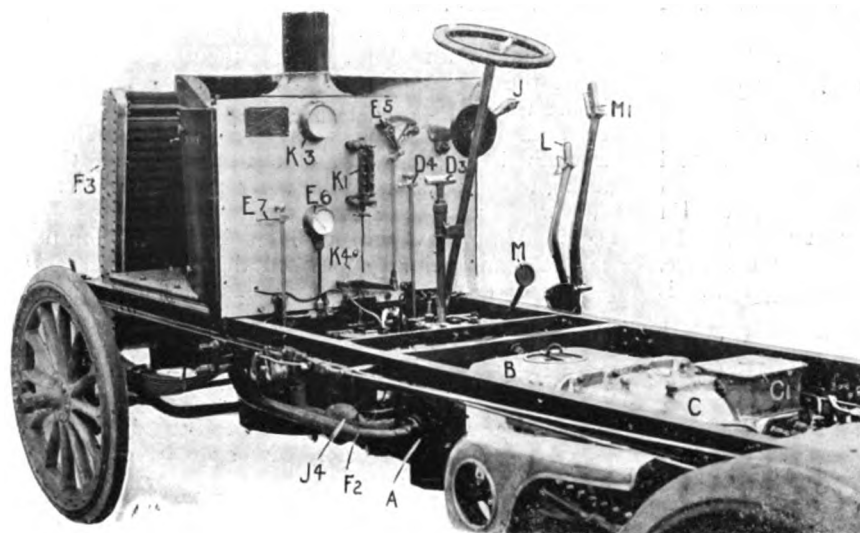


Fig. 3.—The Clarkson Single-Deck 'Bus Chassis. The central and front portion, from the left side.

the oil is forced by the pump, E³, for feeding the burner, and in which the pressure is maintained constant by an automatic valve. This tank is fixed just in front of the dash, on the left side, and is connected with a pressure-gauge, E⁶, on the dashboard.

It only remains, before dealing with the various parts of the mechanism in greater detail separately, to mention that both internal and external brakes are fitted to the hubs of the rear wheels, the former being operated by the side-lever, M¹, and the latter by the pedal, M. Both brakes are sufficiently powerful to stop the vehicle at any time, and provision is made by which either pair can be adjusted readily. The brake-lever, M¹, lies alongside the reversing-lever, L, and the only other control mechanisms that require the attention of the driver are fitted to the dashboard, these consisting of the throttle-valve-wheel, J, a fuel-control lever, E³, and the valve-levers, D¹ and E⁷, to which reference will again be made in due course. There is, however, a hand-pump, D³, fixed to the left of the driver for feeding water into the boiler, if water should be required when the car is standing, and when the mechanical pump is therefore at rest.

The Fire-Tube Boiler.

A complete boiler is shown in Fig. 4, and, alongside it, is one of the two pressed-steel portions, K, which constitute the shell; these portions are identical in shape, and are pressed out of a steel sheet $\frac{1}{16}$ of an

inch in thickness. The projecting flanges, by which the two halves are bolted together, are faced so as to fit closely up against one another, and are fixed by about 100 bolts, as seen in our illustration. The bolts lie so close to one another that it would be impossible to tighten them all up properly with an ordinary spanner if the heads were on the same side of the joint, but this difficulty has been avoided, in a particularly satisfactory manner, by using specially shaped nuts, and by arranging them alternately above and beneath the flange. Owing to the fact that there is only one joint, and that no riveting of any kind is required, an extremely satisfactory, and unusually strong, boiler-shell is obtained, and the chances of leaking joints is eliminated. The overall diameter of the boiler is about 25 ins., and its height is 18 ins.

The top and bottom plates are drilled to receive 588 weldless steel tubes, that have an external diameter of $\frac{1}{8}$ of an inch. The holes are slightly counter-sunk on the outside, to facilitate the special welding process, the depth of the counter-sink determining the ultimate thick-

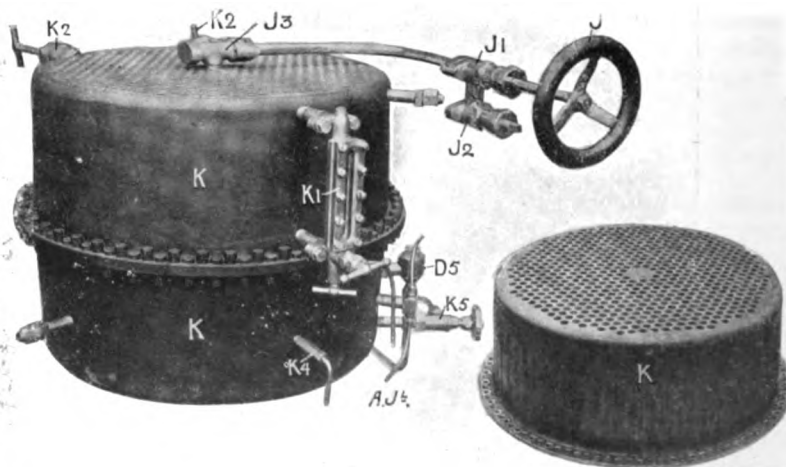


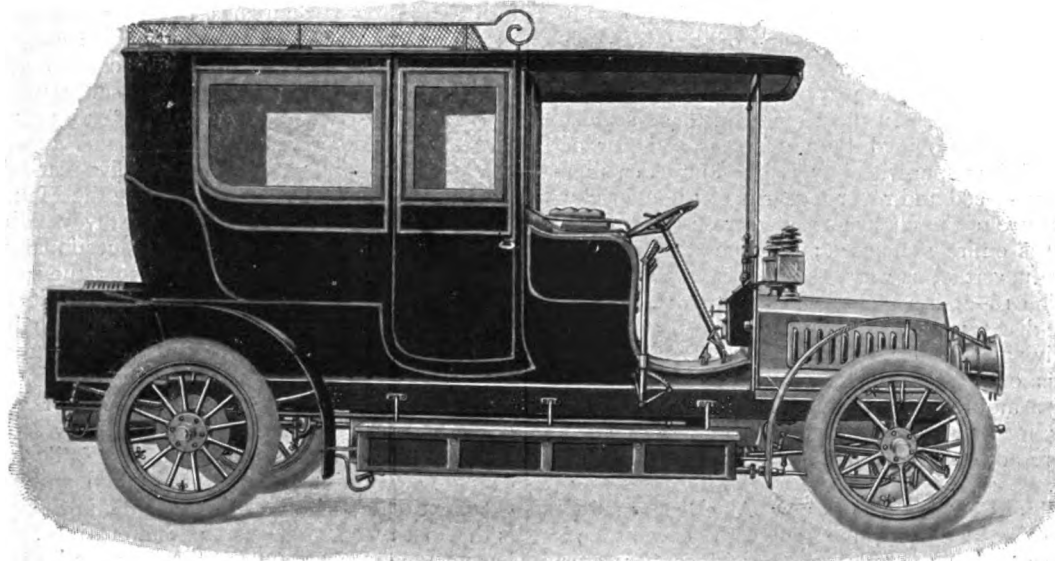
Fig. 4.—View of the Clarkson fire-tube boiler, and of one of the shells, K, used in its construction.

ness of the solid metal connection between the tube and the plate. The operation of welding is conducted with a blow-pipe, and is to all intents and purposes a very similar operation to that of lead-burning or that of brazing, except that the heat of the oxy-acetylene flame is so vastly more intense that the steel flows quite freely, and that coloured glasses are required to protect one's eyes. The steel tubes and the steel boiler-plate become so thoroughly a part of one another, that it is impossible—when a joint is cut through—to detect any dividing lines between them.

(To be continued.)

AGRICULTURAL HALL SHOW.

(Continued from p. 394.)

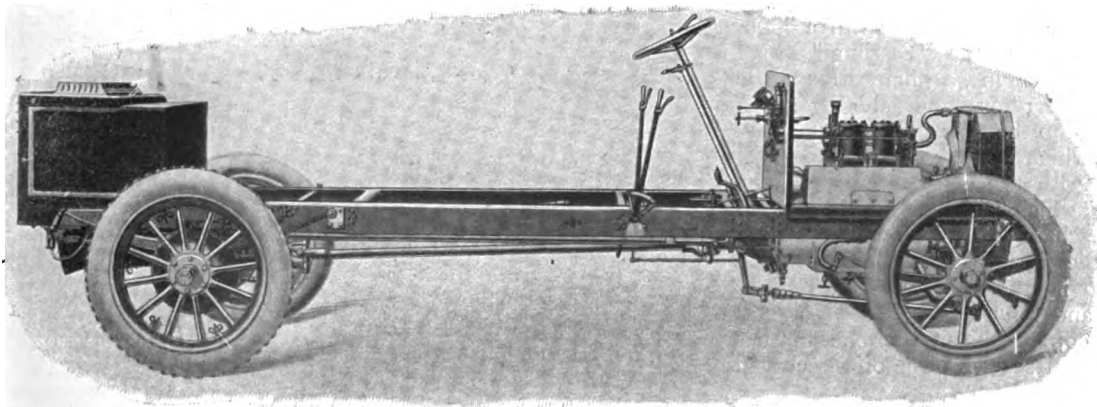


AGRICULTURAL HALL SHOW.—A Chaboche Steam Touring Car, fitted with a luxurious side-entrance body accommodating four passengers inside.

THE Delaunay Belleville cars were shown in both the 40-45-h.p. and 16-20-h.p. sizes, the latter, which is of the live-axle type, not having been exhibited previously. The 35-40-h.p. Rochet-Schnieder chassis exhibited by Messrs. Donne and Williams also embodied new features, among which were the separate cylinders, the casing for the gear wheels on the cam-shafts, and the internal expanding clutch.

The Cupelle car, shown by Cupelle Motors, Limited, is another new Continental car. It is of the live-axle type, is fitted with a 4-cylinder engine, and has a change-speed-gear of the sliding spur-wheel type. The frame is of pressed steel and the cross-members are welded to the side-members, which gives the frame a very neat appearance, and at the same time renders it particularly rigid. An "automatic" carburettor is fitted to the engine, and the "timing" and throttle-levers are fitted above the steering-wheel. The 16-h.p. Motobloc chassis, which

has a 4-cylinder vertical engine, was first shown at the last Paris Salon. The general system has been retained as on the smaller model, which has an engine with a pair of sloping cylinders, for the engine and gear-box are combined with one another; in other respects, however, the 4-cylinder model follows more usual lines of construction. Both the Turner-Miesse and the Chaboche steam touring cars were exhibited, the latter now having, it will be remembered, a vertical engine placed in front under the bonnet. An interesting exhibit on P. Cuthbertson's stand was the Janus double-acting engine, first shown at the last Paris Salon, in connection with which it was then illustrated in our issue of December 17th, 1904. Each cylinder has similar combustion-chambers at each end, and the piston is connected with the crank-shaft by two connecting-rods, one on each side. These engines can, we understand, now be fitted to the Pivot chassis.



AGRICULTURAL HALL SHOW.—Side view of the chassis of the Chaboche Steam Car, showing the vertical engine in front and the flash generator at the rear. A fully illustrated description of this interesting system appeared in our issues of March 28th, April 25th, and May 2nd and 16th, 1903.

A new American car, which has several excellent and novel features, is the Maxwell, for which Mr. F. W. Peckham has the English agency. Two sizes have been made, viz., 8-10-h.p. and 16-20-h.p., but both are similar in general design, although they differ in respect to the type of gear employed, and also with regard to the frame. Both cars are of the live-axle type, both have twin-cylinder engines, with opposed cylinders, and both have the gear-box combined with the crank-chamber casting. In the larger car, three speeds and a reverse are provided by a change-speed-gear of the ordinary sliding spur-wheel type, but in the smaller model, the two-speed and reverse gear is of the epicyclic type. A feature of the change-speed-gear on the smaller car is that it is entirely enclosed; the operating brakes, however, are nevertheless very easily adjustable from the outside. The 16-20-h.p. vehicle has a main clutch of the multiple-disc type, and the smaller car has a similar clutch for giving the top speed. The main frame of the larger car is of pressed steel, but that of the smaller model is of armoured wood. The bodies of both cars are peculiar, for they are constructed entirely of pressed steel, and are not only light, but are neat and of good appearance.

The 4-cylinder Ford is also a new American model. It is of the live-axle type, is fitted with a two-speed epicyclic gear, and has a vertical engine with copper water jackets. The inlet-valves are mechanically operated, and are placed on the same side as the exhaust-valves. The frame is of pressed steel and is carried on full elliptic springs at the rear. Another new American car was to be seen on the stand of Horner and Sons. It is fitted with an 8-h.p. twin-cylinder horizontal engine, with opposed cylinders, has the usual epicyclic gear, and has a single chain to drive the live rear axle. The Civil Service Motor and Cycle Agency showed a small car which is a product of the Pope Manufacturing Company of America. This little car, however, is built on European lines, is of the live-axle type, has a 6-h.p. single-cylinder vertical engine, and a change-speed-gear of the sliding spur-wheel type, giving two forward speeds and a "reverse."

One of the features of the Show was, undoubtedly, the very large number of small cars exhibited. The majority of these are of orthodox design, and call for no special mention, except that some of them are put on the market at a very low price. Among these are the "Service," shown by the Service Car Company, which is of the live-axle type, and is fitted with a 9-h.p. De Dion engine; the "Starling," which has a 6-h.p. engine, a chain drive to the two-speed gear-box, and another single chain drive to the rear axle; the Jackson dog-cart, which is of the live-axle type, and is fitted with a De Dion engine; the "Kyma," which has a twin-cylinder engine and side-chain transmission to the rear wheels; the Horley, which is of the live-axle type, and is fitted with an 8-h.p. M.M.C. engine; and the Polymobile, which is a German copy of the Oldsmobile, but has an additional seat in place of the curved dash.

Several of the better-known small cars were also exhibited, notably the Wolseley (Victoria Carriage Works), Baby Peugeot, Humber, Star, Richardson, and Brown.

The Clyde Company showed one of their small cars, which is fitted with a twin-cylinder White and Poppe engine, and a long "silent" chain-drive to the gear-box on the rear-axle. The gear-wheels of the change-speed-gear are always in mesh, and are brought into action by jaw-clutches, three forward speeds and a reverse being available. A pretty little car was shown by E. A. Guilbert, the diminutive chassis of which is fitted with a twin-cylinder engine set transversely in the tubular frame. The engine drives by chain to the three-speed and reverse gear-box, and another single chain transmits the power to the live-rear-axle. Two small cars of unusual construction are the Maurier Union and the Liliput; both have gradually variable speed-gears of the friction disc type. A questionable arrangement, adopted in the former, is that the crank-shaft is used as a clutch-shaft, and is slid bodily in its bearings to relieve the pressure on the discs, when changing gear.

One of the most recent recruits to the ranks of manufacturers of electric vehicles is the well-known India-rubber, Guttapercha, and Telegraph Works Company of Silvertown, and a chassis of their construction was exhibited on the stand of W. and F. Thorn. These cars are of very interesting construction and have many excellent features in their design. The principal novelty is that both front and rear axles are driven. Each axle has a single electric motor, which drives by spur-gearing on to the differential shell. The front axle has universal-joints at both ends which are concentric with the steering-heads that are formed between the axle-casing and the stub-axles for the road-wheels. The controller mechanism is of especially neat design, is placed in a very accessible position, and has been rendered as fool-proof as possible.

The Extromer, another electric vehicle exhibited, lays claim to having performed a 100-mile run on a single charge in 8 hrs. 10 mins. The chassis has a single electric motor, which drives through spur gearing on to a differential countershaft, from which the rear wheels are driven by side-chains. A battery of 48 Extromer cells is fitted, the weight of which is 13 cwt. 3 qrs. 12 lbs.

(To be continued.)



AGRICULTURAL HALL SHOW.—A Petrol Delivery Van shown by the Thames Engineering Works. The chassis is fitted with a 12-h.p. twin-cylinder engine, a three-speed and reverse gear-box of the sliding spur-wheel type, and the rear wheels are driven by side chains.

CORRESPONDENCE.

*. The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

MOTOR DRIVERS' INSTITUTES.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I have received trustworthy particulars with regard to several motor drivers' institutes, and unions, and associations which are being run by certain people who cannot be acquitted of far greater anxiety for profit than for honesty in their intentions and treatment of those whose money they receive ostensibly for services as teachers of motor car driving and motor car instruction and working. It should be made known to the public that it is necessary to make enquiries in trustworthy quarters before money is paid by or on behalf of men wishing to become drivers. Some of the *soi-disant* teaching bodies may be only incompetent and without necessary appliances, but some are without doubt impostrous parasites.

Yours truly,

W. WORBY BEAUMONT.

THE SHOW QUESTION.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Referring to the interesting letter of Mr. Letts, which appeared in your last issue, we would beg to remark:—

1. That the meeting of the members of the Society of Motor Manufacturers and Traders—at which the proposal that there should be two Exhibitions, namely, one for pleasure motor vehicles and motor boats, and the other for commercial motor vehicles and motor boats, was negatived—was declared by the chairman to be an illegal meeting.

2. That the exhibiting space at the recent Exhibition at Olympia was acknowledged by nearly all exhibitors to be far too small, and the gangways far too contracted.

3. The proposal of the committee of management of the Society that those who have been bondholders for the longest periods should have the preference in the ballot, will tend to discourage those who have recently become bondholders from renewing their bonds, and those who have hitherto not been bondholders, from becoming bondholders.

4. We disagree with Mr. Letts that bonds are no longer desirable. We are strongly of the opinion that they are most desirable, and that if the bond system be weakened, as it surely will be weakened by the recent decision of the administration of the Society, or, if it be abolished as Mr. Letts suggests, the trade generally will suffer at the hands of endless Exhibition promoters, and from the weakness of certain traders who would make a number of Exhibitions possible.

5. That the Society should immediately convene by proper and legal methods a meeting of its members, in order to ascertain whether the decisions of the committee of management in reference to the show question are approved or not approved by the members generally. We are, sir, your obedient servants,

April 4th.

C. S. ROLLS AND CO.

MUTUAL INSURANCE ASSOCIATIONS v. PROPRIETARY INSURANCE COMPANIES.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—We are much interested in the letter from Mr. Fred Thoresby in your current issue, commending the principle, but condemning the practice, of mutual insurance.

That each member shall "see that every other member is equally zealous, faithful and unselfish" certainly exceeds even the proverbial counsel of perfection; but if the members cannot ensure these virtues in each other and their daily operation, they can, at any rate, very largely counteract by a code of rules (for the system is by no means so inelastic as Mr. Thoresby apparently implies) the evils he predicts. Good citizens cannot be made by legal enactments, but evils may be repressed by them, and in similar fashion the members of a mutual association may weed out the undesirables from among their number, or otherwise penalise them. In our circular it is, for instance, stipulated that should the committee have reasonable ground for complaint on the score of repeated negligence in driving or in the upkeep of the car, they may cancel the policy upon giving the offending member seven days' notice.

Mr. Thoresby states that "some hundreds of mutual schemes were started" in 1898 in connection with the Workmen's Compensation Acts. If this was so, there is no room for surprise that they are no longer in being, for the assureds' liability under these Acts was such an extremely unknown quantity that it demanded a single strong association to cope with it, and not a number of weak units.

However, we are sure that Mr. Thoresby does not mean to suggest a comparison of the two risks, for under the Compensation Acts the risks are not only very diverse and complex, but the employer himself stakes nothing beyond a possible premium increase; whereas the motorist on the other hand has a motive for care nearly as great as any one can conceive—his personal safety; and he may, therefore, be allowed an even more than normal share of selfishness without much detriment to his fellow members.

The Motor Acts, too, unlike the Compensation Acts (which create a liability), largely tend to lessen the risk to the underwriter, and altogether we are strongly convinced that the mutual principle should prove very successful for car-owners if it be only granted a fair chance.

Yours faithfully,

J. AND R. BOVEY.

March 25th.

WANTED!

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—As an example of the way in which a certain class of driver acts, and brings the general body of motorists into disrepute, I may give the following instance:—

The Vice-Consul at Dieppe communicated with me in regard to a loan which he had made to a driver who had appealed to him, and produced a letter stated to have been signed by me, written at Rouen, requesting him to cross from Dieppe to London.

On the production of this letter the Vice-Consul advanced him a sum of money sufficient to enable the man to get to London. This was unquestionably a very kind action on the part of the Vice-Consul, which in case of emergency would have been appreciated by any motorist. The trouble in the matter, however, lies in the fact that the man in question, who gave his name as Hubert Jeaniaux, is not known to me, received no instructions from me, and the letter produced by him to the Consul is unquestionably a forgery.

As conduct of this description should, in my opinion, be severely punished, I should esteem it a favour if any of your readers could give me any information to enable me to lay my hands on the offender.

Yours faithfully,

CHAS. JARROTT.

March 31st.

CYLINDER LUBRICATION ON MODERN CARS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I think you would be doing the motor car industry a good turn if you would bring to the notice of makers and inventors the great lack of means for accurately determining the exact amount of oil in the crank-chamber.

I think from what one reads in your able and interesting article on the Brotherhood system, that the Brotherhood lubricator is quite a step in the right direction, but does it go quite far enough? I cannot see any sign of test cocks in the lower half of the crank-chamber; the plugs in the bottom may have tubes *à la* Napier, but even then I think it is a very poor job to have to grovel under the car and perhaps get the contents of the tube up your sleeve or down your neck.

Perhaps the Brotherhood people have such faith in the accuracy of their system that they think they have no need for test cocks or some other arrangement, but I cannot help thinking that it will take a long time to tune the lubricator to that pitch, for as the rings bed themselves and wear the amount of oil passing the rings will vary, and, so to speak, upset the "rate," as a clockmaker would say. I think we want some easy means of determining the exact level of the oil in the crank-chamber at least once a day when the engine is at rest.

I grant the limit of too much and too little is small, but engineers who can tackle carburettor problems should have no difficulty with this small but I think most important detail.

I have owned and driven both steam and petrol cars, and at present have both a Mercedes and a Panhard, so I will give my experience of them in this matter, and as I only have a coachman to clean the cars, I am beginning to know some of their ways.

I cannot think of many cars that even go so far as the Mercedes do, in having test cocks fitted at a (supposed) proper level. I have had three Mercedes cars, and if I filled any of their crank-chambers up till the cocks dripped, they would "smoke" horribly. The consequence is, I have to tip the off wheels up on 3-in. blocks and then fill up, thus getting about the right amount, or level, when the car is down again.

If one uses the drip feed for the cylinders one is sure to over, or underdo it.

I find the best plan is to fill up on the blocks every morning, or,

if on a long run, pump in a measure every 50 miles or so, but it is all guess-work, and very unmechanical.

I find most people say, "Oh, fill up till you smoke," or, "Keep her always smoking." Well, sir, if everyone were to do that, at the present rate motors are increasing on the road, we should in a few years have perpetual fog; personally, I call it bad driving to "smoke." On my Panhard, there are not even cocks put at "about" the right level.

To ease my mind, I have taken the cylinders off, and drilled holes in the crank-chambers, through which I can put a marked stick; but it is a very unmechanical thing to have to do, I think.

I grant the Dubrulle mechanical lubricator is better than the crude Mercedes arrangement, that alternately squirts water, air, and

sometimes oil. I think the lubricator on the Mercedes car is its weakest point; in most other respects, I have yet to see the car that beats it. If the lubrication cannot be done in drops, let it be done in spoonfuls—something on the lines of the F.I.A.T. or Brotherhood, with a crank-chamber gauge combined, placed in a get-at-able position and not in the dark.

I know my remarks do not apply so much to Wolseley cars, and those that have empty crank-chambers, but they do apply to those that use splash, or part splash, lubrication.

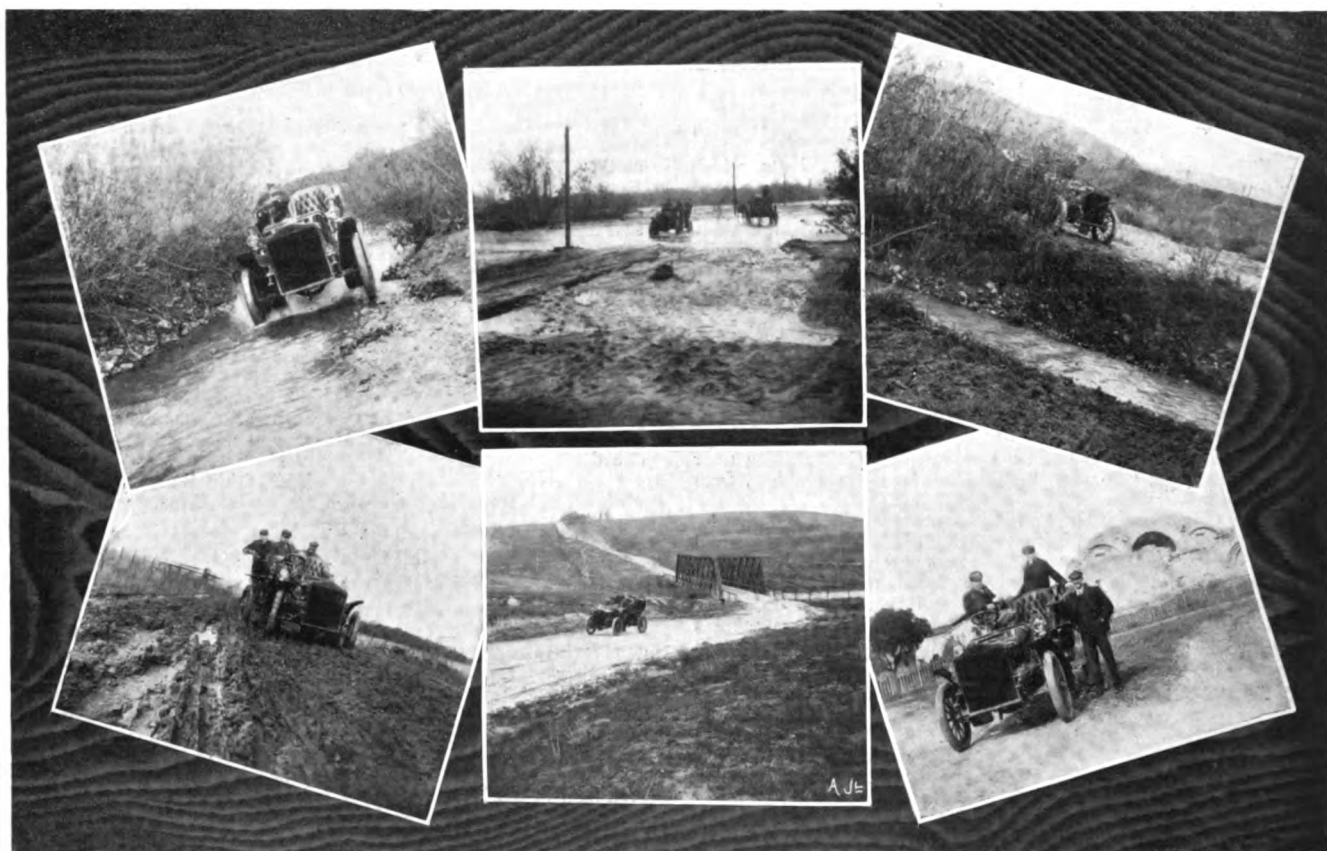
I feel for my motor every bit as much as a man who loves a horse, and I like to feel I am treating it properly. Yours truly,

RICHARD BAYLY.

Plymouth.

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THE WHITE CAR IN THE FLOODS.



Scenes on the semi-aquatic tour of a White Car through the floods in Southern California to the Coronado Beach Races.

THE tornado had passed up toward the snow-crowned summits of the San Bernardino Range, pitching 100-foot firs about like straws in its course, unroofing huge buildings, shifting whole villages like the pawns on a chess-board. And, after it, came the rain, not in solid sheets, but in absolute cubes, rounding off pointed rocks, washing boulders about in the valleys where they rattled together, making wilder music than even a Welsh Revival. And so the floods were out in South California. And Mr. Ryus was out in the middle of them with his 15-h.p. White steam car, battling his way from Los Angeles to the Coronado Beach Course. What should have been road-surface was fluid mud, "one degree more substantial than pea-soup." It came high above the wheel-hubs, and poured into the tonneau, but on went the car, wading along painfully, sometimes taking a river bed, and at times bridging holes that would have been too deep for it but for extemporary bridges

built up from drift timber. A river, in which one of a team of horses had recently been drowned, was successfully crossed, and the very irony of misfortune was reached when, after leaving the floods behind and taking a long grind up a hill, the car ran out of water. Just below the hill, however, it was found that the explorers were on the edge of the ocean, and for once they filled their tank up with salt water, and got home successfully. For all these trials and tribulations, the travellers had to thank one of those misguided, though often well-meaning persons, who are always ready with gratuitous advice, and who persuaded them to take the coast road instead of the higher and drier route further inland. However, all is well that ends well, and this tour certainly shows, as our contemporary, the *Los Angeles Sunday Times* hath it, that "autoing in Southern California is not all oiled roads and oranges."

RACES, RECORDS, AND TRIALS.

Tourist Trophy Race.—Three more entries since last week bring the total competitors in this event to 43. The newcomers are a Scout car by Mr. Percy J. Dean, and two Darracqs by Mr. A. Rawlinson.

Scottish Reliability Trials.—Amongst those who have entered cars for this trial are the Daimler Company, who will be represented by a 30-h.p. carriage, and Mr. E. H. Lancaster, who has entered two Clément cars.

The holding of Light Delivery Van Trials, for loads of up to 2 tons, beginning on September 20th next, was recommended at the Automobile Club Committee this week. At the same time, the Heavy Vehicle Trials, it was advised, should be abandoned this year.

To enable the British Selection Trials for the Gordon-Bennett Race, and for the International Motor Cycle Cup Contest in May, and the Tourist Trophy Race in September, to be run in the Isle of Man, the only formality now required is the Royal approval to the Bill, which has been duly passed by the Manx Legislature, followed by formal promulgation at Tynwald Court.

BEXHILL, it is proposed, should again have a motor race meeting this year, June 3rd being probably the date selected.

Silencer Competition.—Twenty-six devices for this competition, organised by the A.C. de France, have been entered by fourteen firms. The tests commenced on Saturday last at the laboratory of the A.C. de France.

THE A.C. de France have now officially defined to what extent they will permit speed tests on the public roads for the future. Speaking generally, all speed trials, as before determined, are forbidden. But exception to this rule may be made upon application, each case on its merits, for hill climbing contests, mile and kilometre trials, and for contests generally up to a maximum distance of 4 kiloms. on the flat.

MONT CENIS Hill Climb has been fixed to take place on July 16th.

WHEN the Auvergne circuit was originally proposed, we were able to give a few of the leading features of the course. A representative of the *Journal Automobile*

has now been round the Auvergne course in a De Dietrich car, driven by the celebrated Gabriel. His account confirms the view we expressed that in several places, at any rate, it is decidedly ticklish. This is particularly the case near the starting point at Laschamps, where there is a terrible descent with extremely short and numerous turnings. From Laschamps to Puy de Dôme the course undulates moderately, and from the latter place gradually rises to Moreno, where the long serpentine descent commences to Rochefort—"the most delightful village," our contemporary calls it, in the whole circuit. "Hidden away in its valley it breaks quite suddenly on the gaze of the approaching tourist." The road through Rochefort itself appears to be bad, and there is a very sharp turn which cannot be taken quickly without danger. After this is encountered a stiff incline, from which the view, we are told, of Rochefort is delightful, though this will appeal but little, we presume, to the combatants on the day of the race. From this point the course continues always, says our contemporary, picturesque, but full of turns and corners, to Laqueille, at which spot is the most dangerous turning in the whole course. Anybody who fails to take the corner properly will probably tumble from 100 to 200 metres, down what is practically a precipice, on to the top of some houses, so that perhaps in future this village may receive a grant of arms comprising a church steeple impaling a motor car (*all proper* on a field gules). Fifteen kilometres per hour is the maximum speed at which this place may safely be passed, according to the *Journal's* representative—not a racing speed, it must be admitted. After this is encountered another corner not quite so dangerous, and guarded by a statue of the Virgin. Good



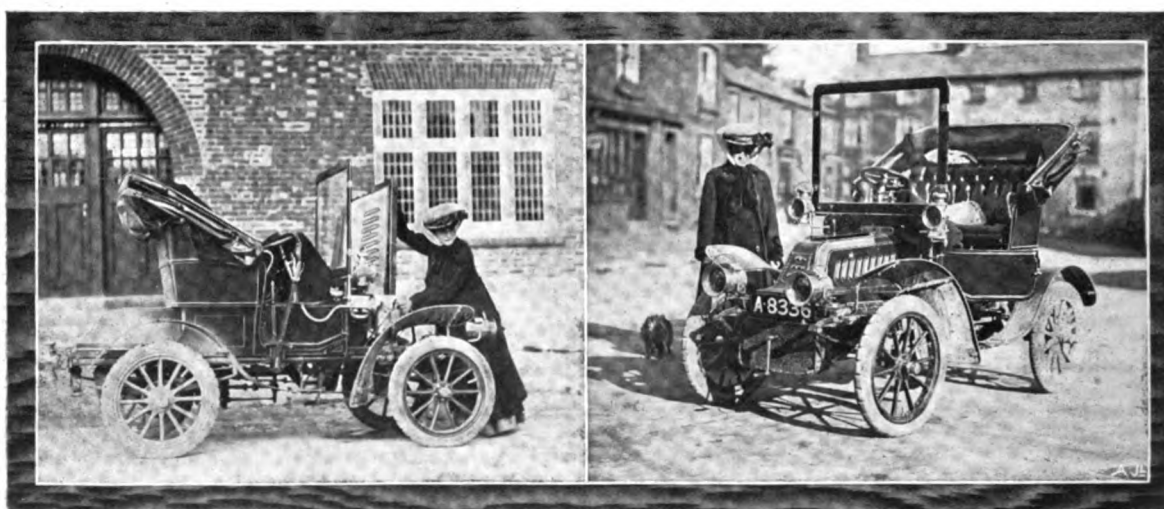
The very beautiful trophy which we reproduce above, known as the Alexander Burton Cup, has been presented by Mr. Burton for competition for motor boats. It will be competed for on April 20th, the start being at Cannes.

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roads lead from this point through Sauvagnat and Chambon up to Pontaurmur. Here the travellers encountered some compensation for their troubles by the discovery of an inn, at which the *chef* of the late Napoleon III. has established himself, and whose cooking is said naturally enough to be exquisite. After Chambon, Goutelle is reached, and then Pontgibaud, through which is a dangerous run down in zigzags, but the arrangement of these enables drivers to see what is on the road in front of them. The general impressions of the course are summed up by the *Journal* as follows:—"It abounds with numerous difficult, and sometimes dangerous, turnings; great care must be taken on leaving Rochefort and arriving at Laqueille. The roads between Bourg-Lastic and Herment and between Pontaurmur and Pontgibaud provide moderate inclines, on which very high speed should be attainable." The whole of the course is marvellously picturesque, and one of the results of arranging the Gordon-Bennett Cup Race to take place there will be to make more widely known one of the most charming districts of France. It will be remembered by English readers that King Edward, when Prince of Wales, was exceedingly partial to spend-

ing a few weeks in summer at Royat, which may be almost said to nestle under the Puy de Dôme.

London to Liverpool and Back on an 8-h.p. De Dion Car—A Lady's Record.—This journey of 409½ miles was, during last week, successfully accomplished in two consecutive days by one of the popular little 8-h.p. De Dion cars, driven by an equally popular chauffeuse—Miss Dorothy Levitt. A start was made from London on Wednesday, March 29th, with Mr. C. J. L. Clarke on board as observer. Liverpool was reached by 6.40 p.m. the same evening, the nett running time being 10 hrs. 14 mins. The outward journey was devoid of incident, and the start for the return journey was commenced early on the Thursday morning. A slight delay was caused by a broken pipe in the circulating water-connections during the homeward journey, but London was, nevertheless, reached at 6.55 p.m. that evening, in the nett running time of 10 hrs. 28 mins. Both the outward and return journeys were thus accomplished at an average speed well up to legal limit, which was maintained in spite of the bad state of the roads reported as prevailing at the time. This performance ranks as a record for a lady motor driver.



Liverpool to London and back on an 8-h.p. De Dion car. Incidents "en route." The photograph on the left shows Miss Levitt repairing a broken water-pipe, outside Stoney Stratford—the only mishap on the journey—while that on the right was taken during a halt for refreshments at Holmes Chapel.



MOTOR CYCLING.

International Cup Race for Auto-Cycles.—Entries:—

Entrant.	Machine.	Rider.
Chas. Jarrott ...	6-h.p. J. A. P. ...	W. Hodgkinson.
Rev. B. H. Davies ...	8 " Westlake ...	H. P. Maffert.
H. Collier ...	6 " Matchless ...	C. R. Collier.
" ...	6 " " ...	H. A. Collier.
H. Rignold ...	8 " Rignold ...	H. Rignold.
E. F. Johnson ...	8 " Humber ...	J. F. Crundall.
A. B. White ...	9 " Roc ...	A. B. White.
Sir A. Conan Doyle ...	9 " " ...	T. H. Tessier.
C. B. Franklin ...	6 " J. A. P. ...	C. B. Franklin.
O. L. Bickford ...	6 " " ...	O. L. Bickford.
A. H. Hay ...	" " " ...	J. S. Campbell.
W. A. Richards ...	12-h.p. Barry ...	Not nominated.
" ...	12 " " ...	" "
" ...	12 " " ...	" "
G. A. Barnes ...	10 " Barnes ...	G. A. Barnes.
G. Wilton ...	10 " " ...	G. Wilton.
Rev. Basil H. Davis ...	8 " Westlake ...	—

The foregoing entries have been received by the Auto-Cycle Club for the Selection Trials to take place in the Isle of Man on May 23rd. The main condition governing the race is that every part of the bicycle must be made in the country which it represents, in this case England. The firms who have entered ensure that thoroughly representative British machines will be matched against the other countries on the Dourdan Course.

PERMITS have been issued for the following motor cycle races on Easter Monday:—

Bury St. Edmunds, 3 and 5-mile handicaps, secretary, H. A. Childs, Norton, St. Edmunds.

Brighton, 3 and 5-mile handicaps, secretary, W. J. Strange, 52, George Street, Hove.

Ipswich, 3-mile handicap, secretary, A. G. Beverley, York House, Oxford Street, Ipswich.

These events will be limited to machines having engines not exceeding 76 × 76, or the equivalent swept out.

CLUBS AND ASSOCIATIONS.

Motor Union Inter-Club Events.—In connection with the meetings of the General Committee of the Motor Union of Great Britain and Ireland, at Nottingham, Leeds, and Manchester, on May 26th, June 24th, and July 22nd, respectively, inter-club meets are being arranged at "The Dukeries," Harrogate, and Chester.

It is expected that these inter-club meets will be supported by most of the clubs in the membership of the Motor Union, and also by individual members.

The following is an outline of the programme, but special arrangements are being made with hotels, garages, railway companies, &c., and these will be announced in due course:—

Nottingham, May 26th.—1 p.m., luncheon at the Victoria Station Hotel; 4 p.m., inter-club meet at Edwinstowe; 7.30 p.m., dinner at the Victoria Station Hotel.

Harrogate, June 24th.—1 p.m., luncheon at the Great Northern Hotel, Leeds; 4.30 p.m., inter-club meet at Harrogate; 7.30 p.m., dinner at Harrogate.

Chester, July 22nd.—1 p.m., luncheon at the Midland Hotel, Manchester; 4.30 p.m., inter-club meet at Chester; 7.30 p.m., dinner at the Grosvenor Hotel, Chester.

North-East Lancashire A.C.—The following list of fixtures has been drawn up:—

Hill-climbing Contest.—For this event there will be five classes—one for cars under cost price of £180, another under £300, another under £500, another under £750, and one for cars costing over £750.

A 200 miles non-stop run to Carlisle and back on the 30th June and 1st July. Also a 100 miles non-stop run to Kendal and back. Date not fixed.

An ordinary club run will take place on 15th April to meet at the Queen's Hotel, Southport, for afternoon tea at 4.30. The following invitations to afternoon tea have been accepted:—Mr. J. E. Riley, Whitecroft, Haslingden, for the 3rd of June; Mr. Fred Hodgkinson, Fair View, Pleasington, for the 22nd of June; Mr. William Birtwistle, Billinge Scarr, Blackburn, for the 29th of July; and Dr. Stephenson, at Blackpool, for the 31st of August.



MR. ALFRED BIRD, of Birmingham, one of the vice-chairmen of the Automobile Club, and chairman of the Races Committee, was last week formally adopted as the Unionist candidate for Wednesbury, the present member, Mr. Walford Green, having decided to retire in consequence of ill health.

TIMES are changing, and constables appear to be changing with them, and are no longer always against the motorist. Possibly the salutary revolution is due to recent demonstration of the uncertainty of convictions and the relative certainty of tips. However, this may be, Police-Constable Francis, of Redbourne, held up an automobilist the other day, and when the automobilist came to a stop, instead of having his number, name, address, and other particulars taken, and the information added that he "would hear more of this," or words to that effect, the constable informed him that he had merely stopped him because he had discovered a patch of road a little further on, which certain evil-disposed and reactionary youths had been strewing with nails, inverted boot-protectors, and other ironmongery, with malice prepense, and for the set purpose of damaging automobilists' tyres. Thanks to the considerate constable several automobilists escaped injury. The destructive youths were haled before a magistrate and duly convicted. The more youths and hobbledehos, and what are generally described in police reports as "youthful labourers," attempt to injure motor cars by underhand tactics of this kind, the more public opinion will veer in favour of the movement; and even police constables, as is shown by this instance, become propitious.

Scottish Automobile Club (Western Section).—The annual meeting of the section was held in Glasgow on Thursday last week, Mr. John Adam presiding. The annual report and accounts showed the membership to be 303, and a considerable balance in bank. The Honourable the Lord Provost Sir John Ure Primrose, Bart., was elected vice-president, and the following the committee for the ensuing year:—Messrs. John Adam, Professor Archd. Barr, H. W. Brock, J. B. Talbot Crosbie, W. H. Kingsbury, T. Blackwood Murray, B.Sc., M.I.E.E., H. M. Napier, Jas. R. Nisbet, H. Prosser, Dr. C. Basil Richards, John M. Ross, J. B. Shanks, Robert J. Smith, Thos. Symington, Wm. Weir. Messrs. J. B. Talbot Crosbie and Wm. Weir were elected auditors. Messrs. James Burns, W. H. Kingsbury, and H. M. Napier, with the chairman and secretary *ex officio*, were elected representatives to the General Council of the S.A.C. The committee, auditors, and honorary secretary were accorded a vote of thanks for their work for the club during the past year.

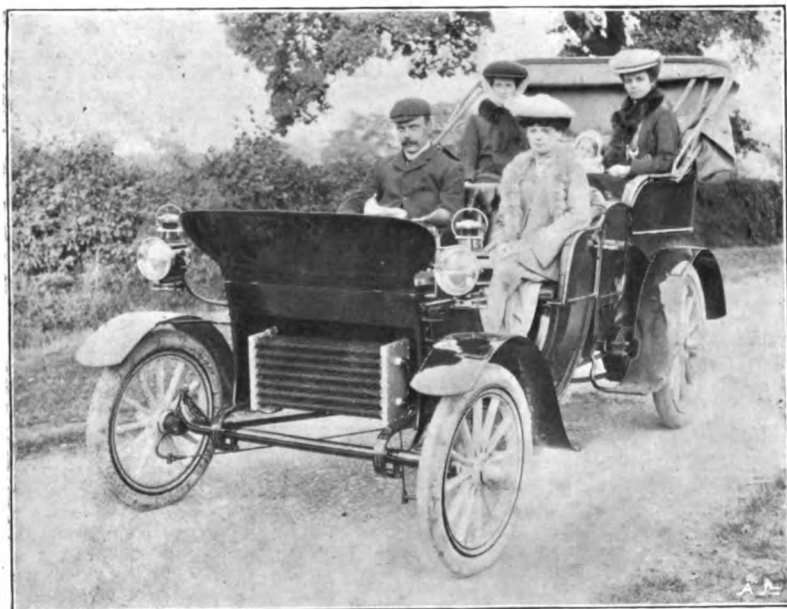
West Surrey A.C.—The annual luncheon of the club was held last Saturday at the Bush Hotel, Farnham, about thirty-six members and guests being present. After lunch, the toast of the Motor Union was proposed by Colonel Fairtlough, chairman of the club, and replied to by the guest of the occasion, Colonel Holden, with his usual ability. After some pertinent remarks on the necessity for active combination and exertion in view of the prospective revision of the law, he instanced as evidence of the resistless spread of the movement a conversation overheard at the Show. An evidently well-to-do visitor, after inspecting the stand of a well-known maker, ordered one of their best and most expensive cars, showing great anxiety that it should be a good one. "I don't want the beastly thing, you know," he remarked, "but I must have it."

Among the guests present were Mr. J. W. Orde and Mr. J. H. Knight, while the members included Messrs. Noble, Ponsford, Pullman, Crothers, Houghton, Turner, Drs. Bryden, Hall, and Gilbert Smith, Messrs. Butemer, Rexworthy, Leon, Warne, and Wrigley.



MESSRS. RANKIN, KENNEDY AND SONS have opened a new manufactory on the Clyde, under the title of the Clyde Motor Boat Works. It is situated in Balmoral Street, Scotstoun, and has been specially designed for motor boat outfitting, marine motors, and specialties.

WE have had all sorts of tests and evidence brought forward in motor car cases to prove the high speed of cars, but a new form of speedometer has been invented by a rustic personage bearing the artistic patronymic of Robert Catermole, a road mender of the neighbourhood of Camberley. Mr. Cecil Bianchi, the well-known racing driver, formerly mechanic to Mr. Jarrott, was accused of driving a motor car at an improper speed past the aforesaid Robert Catermole, and Catermole, on giving evidence of the high velocity at which the car was proceeding, declared that the pace was such that the vortex of air caused by its movement whirled the shovel with which he was plying his trade, completely round his person *no less than three times*. That Catermole possesses imagination of an order which properly applied ought to have raised him above the humble avocation of a road mender, is from this evidence sufficiently apparent. He ought at least to have re-edited the adventures of Baron Münchhausen or have become an expert witness, instead of remaining a "mute, inglorious Milton," scraping the Camberley Road with what after all must be a singularly *light* shovel. The Farnham Bench are rather notorious for believing anything against a motorist, but that they could have swallowed this evidence and fined Mr. Bianchi £5 is a feat of which even their admirers could scarcely have previously believed them capable.



In the construction of the above car, which is a 15-h.p. Duryea side entrance "tonneau," a departure has been made which should prove advantageous to passengers in the back seats. By the rake of the carriage body, it will be seen that a clear view ahead can be obtained by all the occupants of the carriage. This car, which has been specially constructed for the Hon. Charles Weld Forrester, weighs complete 15½ cwt., and will accommodate five persons comfortably, the back seats being exceptionally roomy. Mr. Arthur Preen the Works Manager of the Duryea Company, is seated at the wheel.

A CONSIDERABLE service of motor omnibuses is being organised for the ensuing summer by the London and North Western Railway Company, with the especial intention of facilitating access to some of the picturesque spots lying between Flint and Mold, passing through the important village of Northrop. The Great Eastern Railway Company are also further developing their motor 'bus service, and five routes are to be opened for this kind of traffic in the neighbourhood of Chelmsford and Colchester, linking up remote districts not now served by the railway.

A VERY successful test has been made by the London and North Western Railway Company with a Foden steam wagon, which they are about to employ for the delivery of goods from Holywell Station. It proved itself to be easily capable of hauling its load up a very stiff hill, which is nearly two miles long and has near the top a stretch of nearly a quarter of a mile with a gradient of 1 in 7. The wagon takes a load of 5 tons on its own platform, draws a further load of 2 tons on a trailer, and maintains an average speed of about 6 miles an hour under ordinary working conditions.

IN the debate on the County Council's Tramways Bill it is rather interesting to find Mr. Burdett-Coutts (whose views appear to have undergone a change) on the side of the motor omnibus. "The motor 'bus," said the honourable member, "is as speedy as the electric tram, is manipulated with greater ease, and does not involve the expenditure of the ratepayers' capital." Yes, but perhaps that explains much of the whole situation. There are such excellent pickings over spending the ratepayers' money!

MR. WILSON NOBLE maintains with some show of reason that anyone who wishes to become a really expert automobilist ought not to start his new experiences with a high-class car, but to get the worst machine that he can come across, special preference being accorded to one that is notoriously always getting out of order. In this way he will go through an apprenticeship which will make him equal to anything. The only danger seems to us to be that it might be equal to making him give up motoring altogether. But should this not be generally found to be the case, we may expect special manufacturers to advertise their cars as good for teaching purposes, if nothing else. Perhaps that claim is, after all, more likely to be made by their trade rivals.

EVERYONE will agree with Mr. Coroner Troutbeck who, in holding an inquest over the boy knocked down and killed in Pimlico Street, strongly condemned the careless manner in which hoardings and other similar obstructions were arranged in the streets, the hoarding being the principal cause why the unfortunate boy was run over by the private motor cab which caused his death. The driver of the motor vehicle was not in any way to blame, for the accident was entirely due to the boy suddenly jumping from behind the hoarding.

THE *Car Magazine* still continues to improve both in size and the value and general interest of its contents—this improvement being well shown by the number for the present month. Naturally enough special attention is devoted to motor-boating and motor-boat building, and to the more moderately-priced tourist cars, but on the whole, humorous and amusing elements predominate, as is particularly exemplified by two serials entitled, "The Great Motor Joke," and "Alice in Motorland," the latter being of course a sort of motorist imitation of "Alice in Wonderland," and apparently forming a continuation of a book we recently reviewed. A special article is devoted to the electric tram, the illustrations to which have the good effect of showing the awful chaos which occurs when the tramways of even a small town are converted from the horse to the electric system. In fact, this and the other illustrations ought to do more to rouse the public against further extensions of the electric tram system than anything we have seen for some time.

AT the Budapest Automobile Exhibition, which will be held from May 7th to 21st, the Wolseley Company will have a big range of their well-known vehicles staged, as a sample of what British manufacturers can turn out. In addition, the Wolseley Company will show four motor boats, these latter comprising a 30-ft. and 35-ft. launch, and a 40-ft. racer fitted with a 100-h.p. motor, the fourth craft being a smaller type of racing boat.

Motor Volunteers.—The following appointments have been gazetted this week:—Lieutenants to be Captains: J. A. Holder, the Hon. A. V. Verney-Cave, O. H. Bayldon, J. F. Ochs, R. D. Croall, H. W. Thornton. The Hon. Dudley Carleton, late Lieutenant 9th (Queen's Royal) Lancers, to be Captain.

THE chief engineer of the Metropolitan Water Board, it has been decided, is to have a motor car for his official duties, at a cost of £700.

A MATTER of general interest to automobilists came before Mr. Fenwick recently, in which an automobile firm of Long Acre were summoned for keeping petroleum, by which, of course, is meant petrol, on the premises "otherwise than in pursuance of the licence granted by the County Council." A large number of two-gallon cans of petrol were found on the premises against the provisions of the Act, which necessitate the keeping of petrol, even in tins, out in the open air. A further offence consisted in filling up the tank of a car in the same building in which the petrol (although in cans) was stored. For the first of these offences a £20 penalty with £1 1s. costs was imposed, while in the second case the final costs were £1 1s. respectively. We draw attention to these convictions, as there are probably many occasions on which the same offence is committed through ignorance or forgetfulness of the provisions of the Act.

THE Scheveningen Automobile Week has been fixed for July 17th to 22nd.

PRINCE CHRISTIAN and Princess Alexandrine of Denmark officially opened the Copenhagen Automobile Exhibition, which commenced at the Tivoli Gardens on Saturday last.

KING ALFONSO OF SPAIN, upon his visit to Paris, is to be entertained in the Bois de Boulogne with a battle of flowers in motor cars. The A.C. de France have taken the matter in hand, and June 2nd is the day selected.

By 58 votes to 18 permission for holding the International Automobile and Sports Exhibition in 1907 at the Champs de Mars has been refused by the Paris Municipal Council. There is now considerable speculation as to which site will be finally available. The two on which attention at present is chiefly fixed are Porte-Maillot, and Bagatelle.

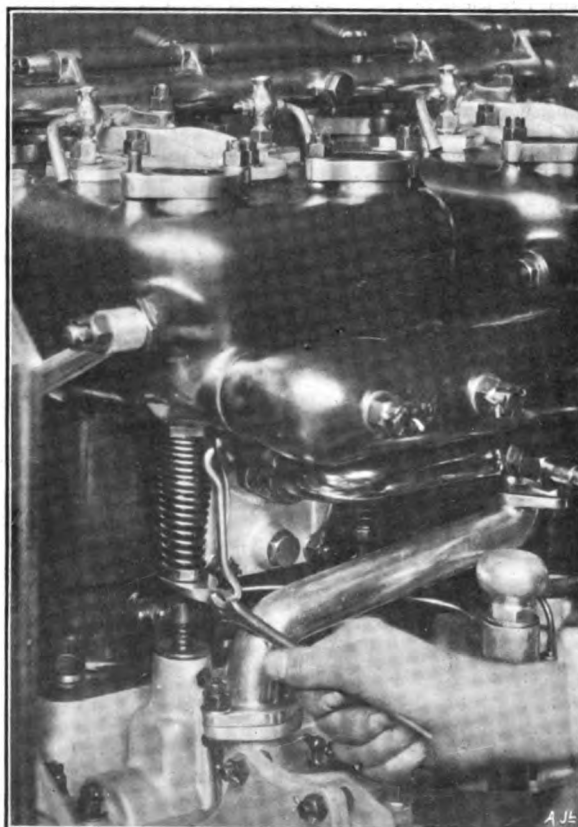
LIKE the Society of Motor Manufacturers and Traders, the Paris Chambre Syndicale de L'Automobile does not look with favour upon manufacturers of vehicles selling their products to local associations and clubs, which grant their members a rebate on such purchases. Whilst the British Society some little time ago contented themselves with informing their members of their views, the Paris Chambre Syndicale have gone a step further, and have made it obligatory for the whole of their members to respect this provision, whilst the French motor dealers have strengthened the hands of the Chambre by compelling their members not to purchase from manufacturers who trade with local clubs and associations.

COMMERCIAL POINTS.

The Motor Boat Industry.—The Motor Boat Trades Committee, formed during the Olympia Motor Exhibition to further the interests of the trade, especially in connection with future shows, has issued its report. It is stated in this report that the Society of Motor Manufacturers and Traders is prepared to set aside 20,000 square feet of space at the next Olympia Exhibition in November for motor boats, and to comply with the wishes of the Motor Boat Trades Committee in the matter of gangways and general arrangements. The society has formed a marine motor section, with its own advisory committee, and this will have the full power and organisation of the society at its disposal. Under these circumstances the Motor Boat Trades Committee feels that its work is done, and therefore disbands, at the same time counselling all members of the motor boat trade to join the Society of Motor Manufacturers so as to obtain the full benefit of representation in the new marine motor section of the society.

THE Continental Caoutchouc and Guttapercha Company inform us that after April 1st, 1905, their business in Great Britain and Ireland will be conducted by the Continental Tyre and Rubber Company (Great Britain), Limited, at 104-108, Clerkenwell Road, London, E.C. No other change will be made in the management or carrying on of the business, which will remain in the same hands as hitherto.

BROOKE cars and motor boats are to be represented in South Africa by Mr. E. J. Ross, who this week has sailed for Cape Town. By way of an instalment, Mr. Ross has taken with him two 12-h.p. Brooke cars.



A very simple and effective device has now been fitted to the Crossley engine, for facilitating the removal of the valves—an operation which is usually somewhat troublesome on all but very small engines. As seen in the above illustration, a small eye is fixed to the cylinder-casting in front of each of the valve-springs, and this enables a long hook to be attached in such a way as to form a fulcrum for a hand-lever. It is then quite a simple matter to compress the spring sufficiently to remove the key beneath the cap on the valve-spindle. The arrangement is both simple and effective.

THE Lanchester Motor Company, Limited, have now concluded arrangements for establishing showrooms permanently in London. From Monday next, April 10th, they will open these at 311, Oxford Street (near Bond Street) where Mr. Frank Lanchester will act as manager of the London Branch. A repair shop on the premises forms part of the scheme.

THE particulars for 1905 of the well-known Cottareau cars have reached us from Messrs. McNeil, Hutchinson and Co., the sole agents for England and Colonies. The large range of sizes includes chassis fitted with single, double, and three-cylinder engines ranging from 8-h.p. to 24-h.p.

A VERY well got-up catalogue of the popular Swift cars has been compiled by the Swift Motor Company for 1905. These British cars are made in the 7-8-h.p. and 12-h.p. sizes, the former having a two-cylinder engine, and the latter a four-cylinder engine. The Swift cars, it will be remembered, secured a gold medal in the recent small car trials at Hereford.

THE Central Motor Car Company send us their new catalogue, which contains particulars of all the latest Ford cars, including the new 4-cylinder vertical model which was first shown at the recent Agricultural Hall Show. The small model still retains the 2-cylinder, approved type, horizontal engine, and the single chain-drive to the rear axle.

VISITORS to Gloucester will be glad to know of a garage in that popular city where they are able to obtain the advice and help of a practical motor engineer. Mr. W. L. Adams has taken over the business of the Gloucester Motor Company, of 41, Northgate Street, Gloucester, and advises us he will always be in personal attendance to ensure that all repairs, however important, may have immediate and personal attention from himself.

NEW COMPANIES REGISTERED.

Bradford Motor Car Company (Limited).—Capital, £8,500 in £1 shares. Object, to acquire the business carried on by E. Pye, at Drill Shed, Belle Vue, Manningham Lane, Bradford, as the Bradford Motor Car Company. First directors, J. Waugh and A. Blyth.

Electric Ignition Company (Limited), Royal Wellington Works, Sampson Road North, Birmingham.—Capital, £10,000 in £1 shares (5,000 preference). Object, to acquire the business carried on by Constance Hall as the Electric Ignition Company. First directors, R. F. Hall and H. Lewis.

J. P. Motor Company (Limited), 24, Mortimer Market, Tottenham Court Road, W.—Capital, £5,000 in £1 shares. First directors, E. Brun, A. D. Barton, and R. R. Meyer-Sec.

Straker and MacConnell (Limited).—Capital, £2,000 in £1 shares. Object, to manufacture and deal in motor carriages, omnibuses, &c. First directors, L. H. Straker and J. MacConnell.

Vale Perfect Tyre Syndicate (Limited), 3, Newhall Street, Birmingham.—Capital, £200 in £1 shares. First directors, W. Vale, S. G. Mason, A. Baker, G. Taylor, A. Stewart, R. Oldfield, H. Vale, and J. Freeman.

Wrexham Motor and Electrical Engineering Company (Limited), 37 and 38, Chester Street, Wrexham.—Capital, £5,000 in £1 shares. Object, to carry on the business of motor and mechanical engineers, builders of motor cars, cycles, &c. First directors, H. Higginson, W. H. Roberts, G. L. Cathrall, and W. Smith.

THE prospectus of the Herne Bay and Canterbury Service Company, Limited, has been issued this week, inviting subscriptions for 9,000 £1 ordinary shares out of a total capital of £12,000. The directors are Alderman Mason, J. P. (Canterbury), Mr. A. T. Green (Herne Bay), and Mr. C. E. Bygrave, captain of the Southern Motor Club. The company has been formed for the purpose of connecting up, by means of public motor vehicles for the conveyance of passengers and goods, of Canterbury, Sturry, Herne, Eddington, Herne Bay, and the surrounding districts.



BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I. Mech.E. Thanet House, 232, Strand, W.C.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

724. 3rd February, 1904. Improvements relating to Internal Combustion Engines and the like. H. H. Lake. Communicated by J. W. Tygard, 1, Madison Avenue, New York, U.S.A. The objects of this invention are to increase the number of working strokes in an engine of like weight to that having a single action piston, to render single cylinder engines reversible, to secure greater radiation from the cylinder ribs, and to lessen vibration and obtain greater steadiness of running. There are thirteen

figures. Fig. 1 is a part vertical section in a central plane and Fig. 2 is a vertical section taken on the line 3 of Fig. 1. The double-acting piston, A, has projecting from its sides trunnions, B, by which it is rigidly attached to the engine frame, C, mounted upon the bed plate, D. Enclosing this piston and reciprocating upon it and upon suitable slides in the engine frame is a cylinder closed at both ends, and having suitable openings or slots, G, Fig. 1, through its side, through which pass the trunnions, B. A connecting rod connects the reciprocating cylinder with the crank shaft and flywheel, J. In a bearing extending through the trunnions of the piston, A, is a hollow valve, L, revolved by chain-gearing, M, from the crank shaft and at a half speed. The rotary valve, L, contains two dividing partitions, and is open at either end. Ports, M', through its side communicate successively as the valve is revolved with corresponding

ports on the inside of the trunnion, forming a valve-seat, K. A fuel vapour combustion mixture is introduced through the inlet end of the valve, N', and alternately conveyed to the spaces between the piston faces and cylinder ends when the engine is making its suction stroke. The piston rings, U, are in the fixed piston. At the other end of the valve the port shown in Fig. 1 communicates at the required times with the port in the trunnion to permit of the escape of the exhaust products. A third port, Q, in the rotary valve permits the charge to reach the parking plug contained within it. In each end of the fixed piston and reciprocating cylinder ends the two revolution or Otto cycle is carried out. Means are also provided for reversing the engine for automobiles. March 30th, 1905.

5324. 4th March, 1904. Improvements in or relating to flywheels. Archibald Sharp, 15, Bridge Road, Hammersmith, W. The invention relates to a mechanism, forming a differential flywheel, which gears down the cyclic fluctuations of speed before the motion is transmitted to the part which has to be driven at uniform speed. The cyclic fluctuation of speed of the driven part may be only a small fraction of that of the engine shaft. There are three figures. Fig. 3 is a section of the flywheel as constructed for driving a motor-bicycle or motor car. The flywheel consists essentially of an epicyclic train of toothed wheels, a series of springs, s, connecting two parts and the mass of the flywheel. The first part, A, is fixed to the crank shaft of the engine in the usual way, and carries the pins, p, on which are mounted the planet pinions, m. The parts, A and B, are each built up of a steel disc, d, having its periphery spun over or otherwise suitably fastened to a large ring, r. This construction enables the greater portion of the mass to be placed near the periphery, and is safer for running at high speed. The planet pinions, m, on the pins, p, gear on their outsides with a toothed annulus or internal gear wheel, c, and the pinions, m, on the other side gear with the teeth, B', of the sleeve carrying the flywheel, H, and the pulley, P. The excess energy of the explosion stroke is partly expended in increasing the speed of the part, A, and the remainder is expended in increasing the speeds of the parts, B and C. The part, B, carries the pulley, P. When the explosion occurs the springs, s, are distended. The outside ends of the springs, s, are connected to the inner of the two rings, r, and the inside ends of the springs to the internal toothed wheel, c. March 30th, 1905.

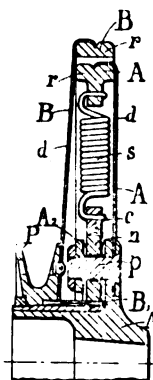
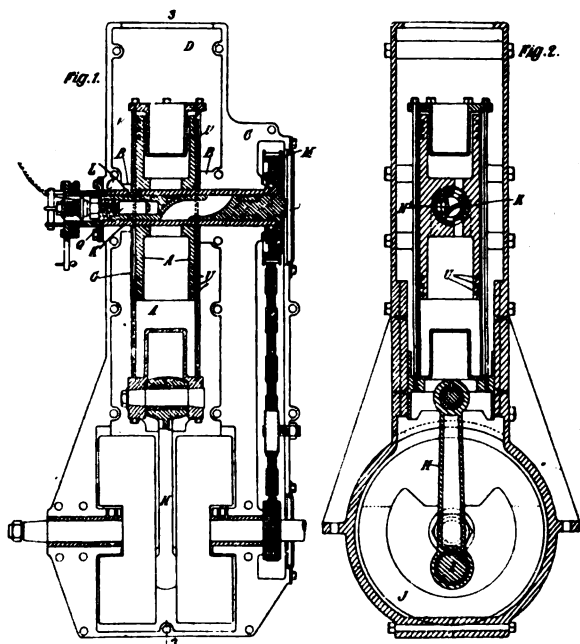


FIG. 3

The Automotor Journal, April 15th, 1905.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

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No. 223. (No. 15, Vol. X.)

APRIL 15TH, 1905.

[Registered at the G.P.O.]
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SYDNEY-MELBOURNE CONTEST.—One of the mountain fords which had to be crossed during this remarkable trial. Full details of the contest are given elsewhere in this issue.

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Nearly all the back numbers can still be obtained separately by application to the Publishers. Many of the back numbers are raised in price; and all other copies beyond a month old are 4d. each. Bound volumes can be had at the following prices:—

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VOL. IV ...	" £1 1s.	VOL. VIII ...	£7 7s.
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When any difficulty is experienced in procuring the Journal from local news-vendors, intending subscribers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.

NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C., by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
May 6...	Auto Cycle Club Hill Climb.
May 10-13 ...	Scottish A.C. Reliability Trials.
May 12 or 19...	*Quarterly 100 Miles Trials.
May 13 ...	Auto Cycle Club Members' Penalty Run.
May 20 ...	200 Miles Trial (Motor Cycling Club).
May 30 ...	*Gordon-Bennett British Eliminating Trials.
May 30 ...	Auto Cycle Trials and "Selection" Race.
June 3 ...	Bexhill Race Meeting.
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.)
June 10 ...	London-Edinburgh (Motor Cycling Club).
June 24 ...	100 Miles Passenger Trial (Motor Cycling Club).
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 4-5 ...	*Motor Boat Trials (Southampton).
July 8...	Auto Cycle Club Consumption Trial.
July 12 ...	*Hill-Climb (Henry Edmunds Trophy).
July 19-22 ...	*Brighton Speed Races.
July 27-28-29	*Blackpool Motor Meeting.
July ...	24 Hours Run (Motor Cycling Club).
Aug. 11 or 18	*Quarterly 100 Miles Trials.
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 19 ...	*Van Trials, Light and Heavy Vehicles.
Aug. 26 ...	Inter-Team Trial (Motor Cycling Club).
Sept. 9 ...	Brown Cup (Motor Cycling Club).
Sept. 12 ...	Auto Cycle Club Race Meeting.
Sept. 14 ...	*Tourist Trophy (Isle of Man).
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).
Sept. 18-Oct. 3	*Reliability Trials.
Oct. 4 ...	*Speed Trials.
Nov. 10 or 17	*Quarterly 100 Miles Trials.
Nov. 17-25 ...	Society of Motor Manufacturers and Traders Exhibition at Olympia.

* Automobile Club of Great Britain and Ireland Events and Papers.

Foreign Events (Trials, Races, &c.).

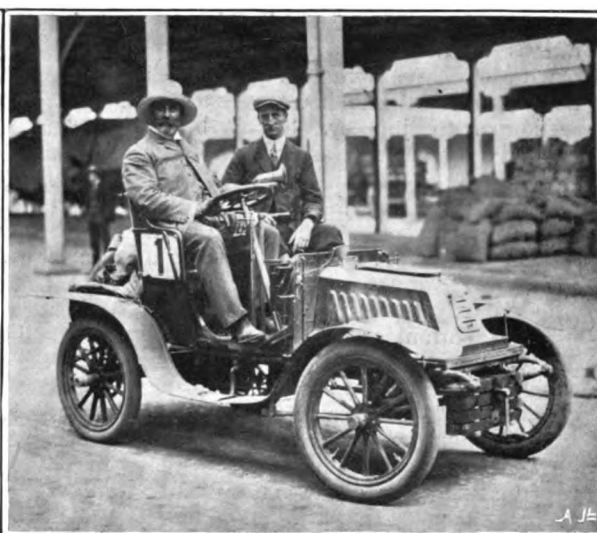
1905.	
Apl. 14-23 ...	Nice Automobile Week.
Apl. 18 ...	Coupe de Caters (Nice).
Apl. 20 ...	Coupe Burton (Cannes).
Apl. 20-21 ...	Cannes Motor Boat Meeting.
Apl. 23 ...	Coupe Provinciale (Nice).
May ...	Paris Industrial Vehicles Trials (A.C. France).
May 11-25 ...	Stockholm Automobile Exhibition.
May 13-21 ...	Auto Cycle Club de France Tour.
May 15-17 ...	Italian Tourist Trial (A.C. Milan).
June 16 ...	French Selection Race for G.B.
June 18 ...	International Motor Cycle Cup.
July 5 ...	Gordon-Bennett Race.
July 9-22 ...	Ostende Automobile Meeting.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Calais-Ramsgate (Motor Boats).
July 16 ...	Mont Cenis Hill Climb.
Aug. 6-7 ...	Circuit des Ardennes.
Aug. 6-9 ...	Paris-Trouville (Motor Boats).
Aug. 10 ...	Gaston Menier Cup (Motor Boats).
Aug. 10-16 ...	Herkomer and Bleichroder Races.
Aug. 11 ...	Anthony Drexel Cup (Motor Boats).
Aug. 12 ...	International Cup for Motor Boats.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Vincenzo-Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.
Sept. ...	Tourist Car Trial (A. C. de France).
Sept. 3-10 ...	Royan Meeting.
Sept. 3-10 ...	Spa Automobile Club.
Sept. 11 ...	British International Cup (Motor Boats Arcachon).
Sept. 12-14 ...	Lake Lucerne Motor Boat Meeting.
Oct. 1 ...	Chateau Thierry Hill Climb.
Oct. 15 ...	Gaillon Hill Climb.

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Capt. H. Tarrant, the winner of the Trial, on his 10-h.p. Argyll car fitted with Dunlop tyres.



Mr. J. H. Craven on his 8-h.p. De Dion car, the winner in the Light Car Class, and second in the Car Contest.

SYDNEY-MELBOURNE CONTEST.

19 miles per hour. From the time that the cars and motor cycles finished the overland run from Sydney to Melbourne they had been sealed up, and no repairs were allowed prior to the start for this final event, although each contestant was allowed five minutes to put his motor in order before starting, and his observer was permitted to assist in adjusting. The weather conditions for the contest were perfect, and the event created great interest, not only in Melbourne, but all along the route to Ballarat.

The competitors in the final were started from the Melbourne Hay Market at intervals after 6.45 a.m., the starters being: Light cars—J. G. Coleman (7-h.p. Swift), J. H. Craven (8-h.p. De Dion), S. H. Day (8-h.p. De Dion); Motor cycles—B. James (1 $\frac{3}{4}$ -h.p. Minerva), V. Gard (3 $\frac{1}{2}$ -h.p. Brown); Heavy cars—H. Tarrant (10-h.p. Argyll), W. S. Ross (10-h.p. Argyll), H. L. Stevens (12-h.p. Darracq), and S. Scott (12-h.p. Decauville). Once over the bad road through Footscray, good progress was made, and Bacchus Marsh (32 miles distant) was reached by all the contestants soon after 10 a.m. Craven lost five points through a faulty accumulator before he had gone a mile on his journey. Had it not been for this slight trouble he would have tied with Tarrant, as he established a non-stop run for the remainder of the journey. After leaving the Marsh, some heavy climbing

had to be done over the Pentland Ranges, but, despite the fact that the road rises some thousands of feet up to Ballan, and that the road is more or less hilly into Ballarat, good time was made into the Golden City, which place was reached by Craven at 10.36, and by Stott, the last man in, at 12.42. Stevens was unfortunately put out of the test before reaching Ballarat, owing to engine troubles. A similar fate befel Coleman, who had the misfortune to strike a stray cow that was on the road. At Ballarat, a large crowd collected to witness the contestants "sign on" and fill up with petrol, water, &c., five minutes being allowed for this purpose. Once on the homeward journey greater speed was attained, the road having a falling tendency for some thirty odd miles.

At Ballan, the order was:—Craven, 11.47; Day, 11.55; Tarrant, 12.55; James, 1.14; Ross, 1.39; and Gard, 2.3.

In negotiating Pike's Pinch W. Bruce, one of Gard's motor cycle observers, had a nasty fall owing to the belt of his cycle jumping off. Bruce was thrown 30 feet along the road, and escaped with some bruised ribs and abrasions. He was picked up by Sydney Stott, and brought into Melbourne. Owing to the good times established by Craven and Day, it was seen that these two drivers could reach Melbourne long before the



SYDNEY-MELBOURNE CONTEST.—Mrs. B. Thomson, the only lady competitor in the trial, on her 7-h.p. Wolseley, after finishing at Melbourne.

schedule time allowance was up, but, as one of the conditions of the contest was that competitors must not reach Melbourne more than 45 minutes ahead of time, both Craven and Day had to slacken pace over the last section of the journey. Shortly before 3 o'clock Day hove in sight, and a few seconds later signed official time sheet at 2.53. Two minutes later Craven also finished his journey, and, as the winner of the light car class, was loudly cheered. Time passed by, and yet there was no sign of Tarrant; the spectators began speculating as to whether Tarrant would lose the contest to Craven, who had only lost 5 points, but at 3.20 a shout went up, and Tarrant crossed the line, having covered the double trip in 7 hrs. 5 mins. Tarrant drove the full distance, 140 miles, without a stop, and thus won the competition. His average speed was slightly under 20 miles an hour, which could, no doubt, have been easily increased, but the winner wisely drove to score full points, and was not intent on putting up fast times. The winning car was a twin-cylinder Argyll of 10-h.p., weighing 1,596 lbs. It was shod with Dunlop motor tyres, which came over the 712 miles of rough roads without a cut or puncture.

Next to arrive was B. James on his 1½-h.p. Minerva motor cycle. His riding time was 7 hrs. 37 mins. 30 secs. As his time allowance was 7 hrs. 30 mins., he lost eight points on time, besides which he stopped 7 mins. on road, thus losing fifteen points in all, but as his only opponent, Gard, was behind time at Ballan on the downward journey, there was no doubt about his winning this section of the contest. The Kelmsley Cup, therefore, goes to James, who throughout the whole competition had ridden grandly. The last to reach Melbourne was Stott at six o'clock, he generously losing time by waiting to bring along Bruce after his accident at Pike's Pinch. The result of the final contest is as follows:—

Maximum points, 500. Motor Car Section (Buchanan Cup, Garland Cup, and Motoring Blue Riband for 1905): 1st, H. Tarrant (10-h.p. Argyll), 500 points; 2nd, J. H. Craven (8-h.p. De Dion), 495 points; 3rd, S. H. Day (8-h.p. De Dion), 462 points. By scoring highest points in the light car section, the Robert Hurst Trophy falls to J. H. Craven, who drove most consistently throughout the whole contest. Motor Cycle Section: 1st, B. James (1½-h.p. Minerva), 485 points; 2nd, V. Gard (3½-h.p. Brown), 455 points.

As to the five days' run itself, nothing could have been much more exciting than the experiences it provided. "Automobilism in the Bush" is a title which might well be applied to one part of it, but from the very beginning the roads developed characteristics which, it is to be hoped, are peculiar to the colony, although it is said that Americans admit their country to be a winning rival in this respect.

Competitors had to be up betimes in this event, and by 5.30 a.m. a start was made from Sydney for the first stage. Enthusiasm naturally rose high, and local maidens, true to their motto, "Advance Australia," got up sweepstakes on the trial, and one of the fair gamblers, inspired by what she doubtless regarded as a lucky "draw," apostrophised an elderly motorist with the salutation, "there's my colt," to his no small embarrassment, not to say dismay.

Getting to the outskirts of a town is seldom a very simple business, and the practice of strewing the first stretch of the route with red paper was commendable. For the first twelve miles the road was good, and then came a sandy cart track, on which, curiously, bicycles skidded and car wheels at times refused to grip.

The principal characteristic of the Australian country road—or, at any rate, the characteristic which the motorist feels most forcibly—is the V-shaped culvert which occurs now and again. To go over these traps at twenty miles an hour or more is to be in serious danger of suddenly quitting the car; they had their effect, too, on the mechanism of the vehicles before Melbourne was reached. Even on a straightforward road they are not easy to see, but when there are alternate stretches of new blue macadam and old dusty metal, as was the case in places, they become still more difficult to detect.

One of the most exciting scenes *en route* was the fording of Paddy's Creek—the subject of one of our illustrations—and it was here that Mrs. Thomson, the only lady driver, got water in the carburettor of her little Wolseley. Paddy's Creek is approached by the Devil's Elbow, a dangerous place, which was luckily the cause of no mishap.

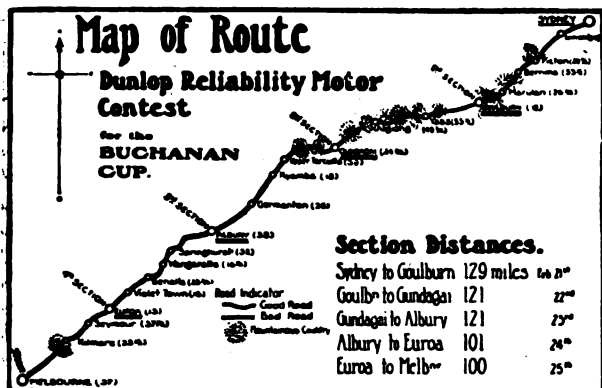
All along the route the inhabitants took keen interest in the cars. The residents of each successive section made holiday on the day that the cars passed through, and parties in buggies and other horsed vehicles went out to cross roads, and there en-

camped for the day, picnicking between the passing of the cars. Right away from the towns, where only gum-trees thrive, a human being would ever and again suddenly appear, as if from the ground, and cheer the passing cars with great enthusiasm. In the villages the school children were keeping holiday, too, and a notable contrast to what has occurred in the old country was provided by the attitude of the Church, as represented in the person of the clergyman of Berrima, who made himself most conspicuous in calling out information, and urging on the competitors as they passed.

From Goulburn to Gundagai the roads improved, and, in fact, this, the second day's run, was considered the best of all. Two accidents to cars marred this stage of the event, but happily no competitor was seriously hurt. Just beyond Bowring Mr. Rand's 20-h.p. Decauville—the largest car entered—was damaged by a side-slip, and a little further on, while going down the



SYDNEY-MELBOURNE CONTEST.—The Buchanan Cup, the chief trophy of the Trial.



hill between Jugiong and Coolac, the rear wheel of Mr. A. E. Langford's 12-h.p. Darracq gave way, probably as the result of being strained in a rut earlier in the day.

It was not until the third day, while the cars were going from Gundagai to Albury, that the weather changed to bad. The rain started somewhat late, but those who were out in it received the full benefit of the blinding hail and wind which swept across the open country. This was the worst section of the route, quite apart from weather considerations, so that the rain was only an additional evil. The roads are bad from twelve miles

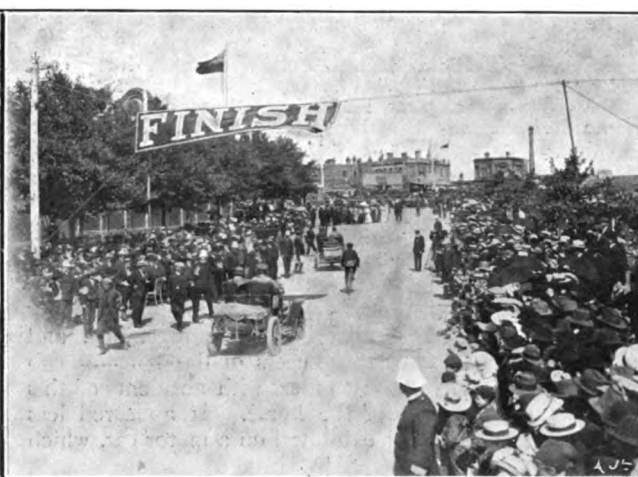
out of Gundagai, but forty miles out they degenerate into loamy tracks, with a series of bad hills thrown in. At Albury, as at all other stopping places, the motorists received an enthusiastic welcome, but perhaps the inhabitants reserved their especial warmth for Mrs. Thomson, as being the only lady competitor, and Mr. Fuller, a citizen of that town, as being the "local hope."

Mrs. Thomson drove most pluckily throughout the competition, though in several places she had very bad luck, which considerably retarded her. Needless to say, her appearance excited the chivalry and enthusiasm of the colonials to a high pitch, and at nearly every town and village through which the route lay she received quite an ovation.

The feverish excitement began to wear off during the fourth day's run from Albury to Euroa, more especially as the effects of the previous days' jolting were beginning to cause trouble with some of the machines. No one was sorry, therefore, to feel the next morning that they had entered on the last lap, and there were few of those so fortunate as to reach Melbourne, but thought themselves well through with a very arduous performance. Even then, however, the competition was not finished for *all*, because no less than nine competitors had scored full marks, and it was necessary to go through with the final "run off" from Melbourne to Ballarat and back (the result of which we have already given) to decide the actual winners of the much-coveted trophies.



The finishing point of the trial at Haymarket, Melbourne, looking up the course. H. Tarrant winning the final "run off" from Melbourne to Ballarat and back, 140 miles.



Scene at the finishing point, looking towards Haymarket, in Melbourne. Fully 15,000 people were present to receive the competitors.

SYDNEY-MELBOURNE CONTEST.



COLONEL PURCHAS, the Commandant of the Gordon Boys' Home, has asked in very modest terms that an automobile may be placed at his disposal for teaching the boys of that institution to become motor drivers. We heartily hope, with Major Lindsay Lloyd, that not only one but several automobiles may be placed at the Colonel's disposal, for there are no more admirable institutions in the country than the Gordon Boys' Homes, and the lads are the very material in most cases to make first-class drivers when they come to maturer years. It must be borne in mind that there are quite a large number of Gordon Boys' Homes distributed

throughout the country, and nothing could be better for the future of the boys than that Colonel Purchas's suggestion for the London Boys' Home should be adopted in the case of the provincial homes as well.

A good commencement has already been made. The Chairman of the Automobile Club, the Hon. Arthur Stanley, M.P., having contributed £5 to a fund that has been opened for carrying the suggestion into effect, and his example has been followed by Mr Lionel de Rothschild, who has contributed £25. This send-off will no doubt bring other subscribers, who may forward donations to the club.

AGRICULTURAL HALL SHOW.

(Concluded.)

AN electric cab, exhibited by the Phoenix Carriage Company, was chiefly remarkable for the body. The front window of this vehicle is so constructed that



AGRICULTURAL HALL SHOW.—Steam lorry constructed by Jesse Ellis and Co. The boiler is of the locomotive type, the compound engines lie horizontally beneath the frame, and the live-rear-axle is driven by spur-gearing, a special device being fitted in order to keep the axle parallel to the main frame, which carries the engine.

it opens outwards directly the passenger tries to fall through it. Simultaneously with this movement, the doors of the cab are automatically locked, and the passenger is thus prevented from being precipitated over the dash. The construction is most ingenious, and should prove a boon to those users of the hansom cab who have the misfortune to meet with accidents of this nature through a fall of the horse. It appeared less convincing, however, as exhibited on a motor car, which type of vehicle is exempt, by virtue of its four wheels, from the dangers against which this ingenuity is mainly intended as a safeguard.

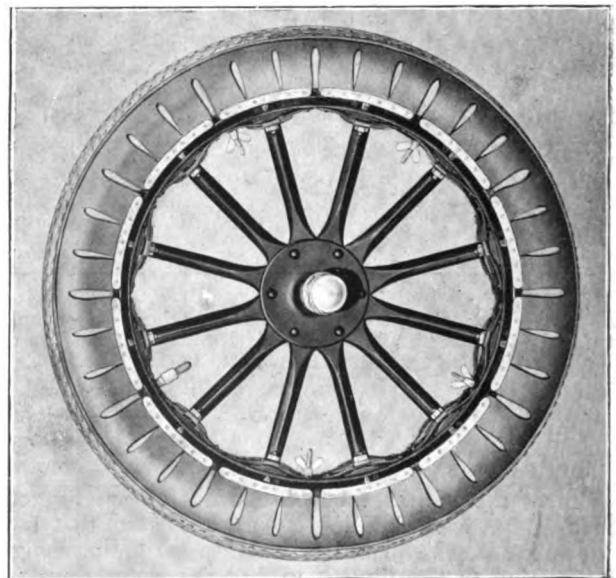
A petrol electric car was exhibited by Kuettner, MacDonell, and Cookson. The rear wheels are driven, through spur-gearing, by separate motors which are supplied with electric energy from a dynamo driven direct from the petrol engine. No accumulators are employed for the purpose of storing energy for use in assisting the engine on hills, so that the system adopted is virtually a "fool-proof" change-speed gear which gives five forward speeds, two "reverse" speeds, and one electric brake position.

As usual, a very complete show of tyres and non-skids occupied a large part of the galleries, but of these little mention need be made so soon after Olympia, where all the first-class makers were also represented. The Dunlop Company had a large exhibit of their famous tyres, and showed besides that relic of the past, the first pneumatic of 1845. The North British Rubber Company also showed their Clincher tyres, the Ducasble solid tyres, and specimens of their twin-tyred wheels for motor

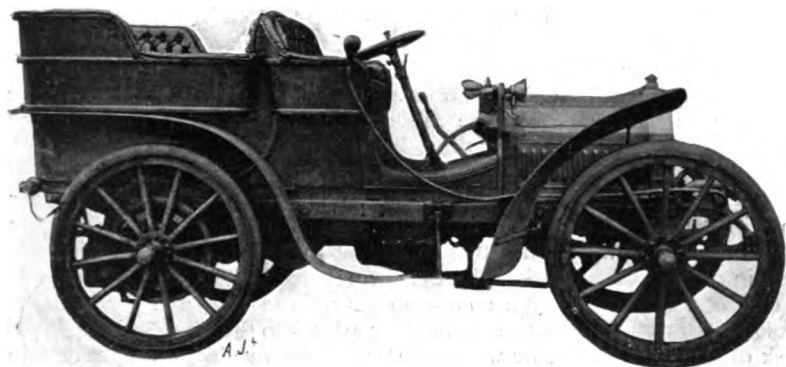
buses. The Shrewsbury and Challiner Tyre Company also exhibited their well-known solid tyres, of which there are now several different types. Reilloc tyres, both solid and pneumatic, were shown by the Reilloc Tyre Company. Other exhibitors of pneumatics were Mosley and Sons, who showed the tubeless Seddon tyre, Gauthier and Co., who exhibited Gaulois tyres, the Bavarian Rubber Works, the Imperial Tyre and Rubber Company, and the Peter Union Tyre Company who also showed pneumatics suitable for their detachable flange fastening.

Something startling in the way of tyres is by no means unusual at these exhibitions, and this time there was the Russell. The Russell tyre is a pneumatic, but the walls of the outer cover are formed by numerous steel links, which tie the rubber tread to the rim. The Jackson tyre is another extraordinary device; it is a pneumatic with two air tubes, each of which is of semi-circular section. The two tubes are placed side by side in the single cover, and it is intended that, when one is punctured, the other should be more fully inflated to take its place. The Thompson solid tyre is also of peculiar construction; it is built up in sections, which project radially through rectangular holes in the flat rim. These sections are held in place by wedges forced under them, and the wedges themselves are kept in place by detachable flanges, which are bolted to the felloe.

Numerous non-skids were also exhibited, notably the Samson, shown by Capt. Masui, De Fournier,



AGRICULTURAL HALL SHOW.—The Watkins detachable non-skid band is constructed of canvas, and is held in place by bolts, secured at intervals to the fabric, which pass through a steel rim fastened to the felloe. Small leaf springs, visible in the above photograph, are placed under the nuts on the bolts, in order to take up any slack which may occur while the band is in use, more especially at that part of the cover immediately in contact with the road.



AGRICULTURAL HALL SHOW.—A petrol-electric touring car. The rear wheels of this vehicle are independently driven, through spur-gearing, by separate electric motors. The electricity is generated in a dynamo which is coupled to a 12-h.p. petrol engine, and no accumulators are used for the purpose of storing energy. The controller gives five forward speeds, two reverse speeds, and one electric brake position.

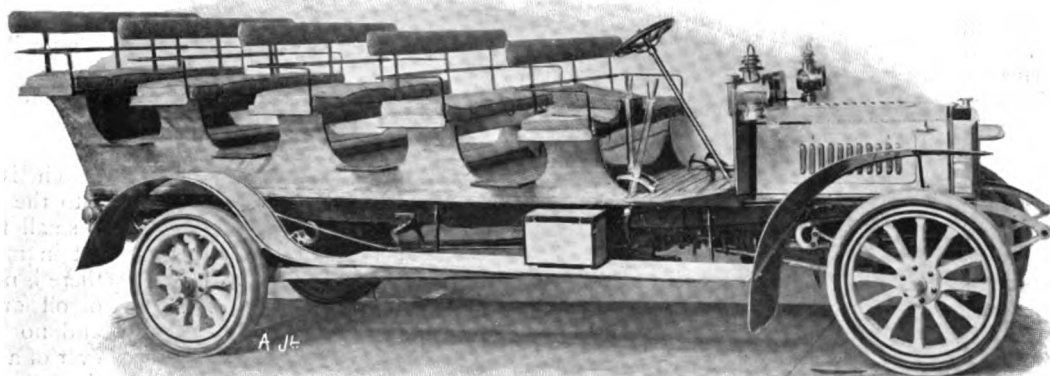
Pullman, Otto Bennett, Grose, Wilton Cox, Lempereur (Mann and Overton's), Watkins and Desclée. An ingenious device, which is intended to save motorists the trouble of repairing punctures *en route*, is the Stepney wheel. It consists of a spare tyre mounted on a rim, which is provided with clamps for the purpose of attaching it

to the road wheel, alongside the ordinary rim. The method of attachment must throw considerable strain on the fastenings, but the device is one which will probably appeal to a good many motorists, as being an easy method of avoiding the necessity of mending a puncture on the road.

The usual comprehensive assortment of component parts were exhibited by Smith, Parfrey, and Co., who also showed their excellently constructed artillery wheels. Accessories were of course shown by a very large number of firms. Gamage's and Dunhill's exhibited motor clothing, and S. Smith and Sons showed a fine collection of their beautifully made speed indicators, mileage recorders, and motor clocks.

The aeronautical exhibits, which occupied a large room off the gallery, were of a most interesting nature, and

included a model of the Lebaudy airship, the envelope for the original of which was constructed by the Continental Tyre Company. For the first time, too, they made a direct appeal to the lay public, for a small Spencer airship was on sale for the moderate sum of £250, complete "with full instructions for management."



AGRICULTURAL HALL SHOW.—The "Churchill" char-a-banc has seating capacity for 20 passengers, including the driver. The chassis is fitted with a 24-h.p. Aster engine, and a gear-box of the sliding-spur-wheel type giving three forward speeds and a reverse. The wheel-base is 14 ft. 6 ins., and the rear wheels are driven by spur-gearing, the differential countershaft being carried on the long angle-iron radius rods which tie the back axle to the frame.



ADDITIONAL proof of the increasing popularity, both of the automobile itself and of the London County Council as a Licensing Authority, is provided by the fact that the number of motor cars and motor cycles registered by the Council is already approaching five figures. It is only looked upon as practical to register up to numbers of four figures under any one letter, and the consequence is that "A," the London County Council letter, will soon be quite filled up. The Local Government Board has accordingly been asked to provide a fresh letter for the L.C.C., and it is understood that the reference letters, "L.C.," are likely to be adopted by the Council in the near future after No. 9999 has been apportioned.

DETERMINED attempts are to be made to introduce the automobile into Uruguay, and a petition is shortly to be presented to the Monte Video Legislature asking them to allow the admission of a hundred self-propelled vehicles free of import duty. Automobiles have hitherto been practically unknown in Uruguay, though in the neighbouring State of Buenos Ayres numbers of them are to be encountered. This, it is understood, is principally due to Buenos Ayres being provided with good roads, and Uruguay with very bad roads on the United States pattern. After the hundred automobiles have been admitted and duly admired, therefore, it might be as well if the Legislature would go a step further and order some improvement to be effected in the country's roads.

THE LATEST CLARKSON STEAM 'BUSES.

(Continued from page 450.)

THE boiler-shell is slightly conical, instead of being strictly cylindrical, and, after having been fitted with its tubes, is tested to a pressure of 800 lbs. per sq. in. hydraulically, and 400 lbs. per sq. in. under steam. The total heating surface is about 100 sq. ft.

Nothing is more important in connection with this boiler, as now made, than the fact that the tubes are welded, instead of being expanded and beaded in place in the tube plates, for one of the only serious drawbacks which have been experienced with those Clarkson 'buses that have been in use hitherto has been the risk of leaky boiler tubes. Now, apparently, even if the boiler is allowed to run dry, it cannot be "burnt," for there is no chance of any leakage occurring until the temperature is raised sufficiently to melt the steel. The entire boiler being made of steel, no difficulties are experienced through unequal expansion of the tubes and of the shell, and obviously the heat of the burner is far from sufficient to cause any melting to take place. Mr. Clarkson claims that his fire-tube boilers are now virtually as indestructible as "flash" steam generators, and that, by the adoption of the process of manufacture above referred to, he has entirely removed all objection to their commercial use.

Included amongst the boiler fittings, are the Klinger water-gauge, K¹, a pair of spring-loaded safety-valves, K², the pressure-gauge, K³ (visible in Fig. 3), the tri-cock, K⁴, at low-water level, and the blow-off valve, K⁵. The gauges and the tri-cock project through the dashboard on the car, and the safety-valves—which are set to blow off at 350 lbs. per sq. in.—project through the sides of the outer casing. These valves are fitted with handles at their outer ends, so that they can be tested for freedom of working at any time. The steam fitting, J³, for the main steam pipe, J⁴ (Fig. 2) is mounted centrally in the top of the boiler, and there are two throttle-valves, J¹ and J², for the steam to pass through in succession. The valve, J¹, is that to which the controlling hand-wheel, J, is attached, but the other valve,

J², can only be opened or closed by a detachable key; the latter valve therefore acts as a safety lock for use when leaving the vehicle standing.

The steam, before passing to the engine, is led through a superheater that is fixed beneath the lower tube-plate of the boiler, and is thus rendered thoroughly dry. The other boiler fittings visible in Fig. 4 include the check-valve, D³, for the feed water, and one or two other pipe connections that are available for different purposes. One of them passes to the automatic fuel-feed device, by which the burner is shut down when a certain steam pressure is reached, another permits the automatic water-feed device to be coupled up, when it is adopted, and there is a pipe-connection that is in some cases led to a small radiator for warming the vehicle in winter.

The burner has undergone but little modification since it was last fully described in our columns, and is—it will be remembered—fitted with a neat starting device by which the vaporising coil is initially heated from a small paraffin lamp of special construction. A lighted match is dropped into the lamp, and a small fan, E⁴, is set in motion, but there is no handling of oil or oil cans, and no risk whatever of a conflagration through any carelessness of the driver. The burner is fed with oil from the pressure-tank, E³, which contains sufficient air to act as a cushion for it, and is connected up with the gauge,

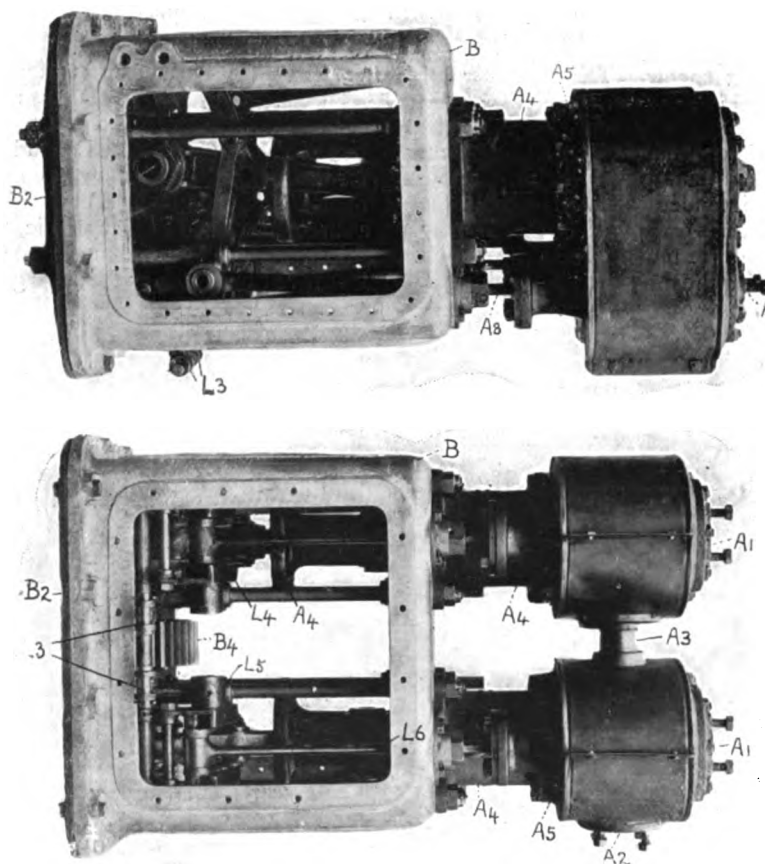


Fig. 5.—Views from the right side, and from beneath, of the Clarkson twin-cylinder steam engine, with the covers and base of the crank-chamber removed.

E⁴, on the dashboard. The feed-pump that forces the oil into the tank, E³, works whenever the engine is working, but there is a by-pass valve which automatically returns the oil back to the other side of the pump as soon as the desired pressure has been attained. The tank, E³, holds sufficient oil for feeding the burner while the car is standing, and, in order to prevent the pressure from falling through leakage, there is a lock-up valve (E⁷) to enable the driver to shut off the connection between the tank and the pump. It is found in practice that the oil gradually absorbs the air that forms the cushion in the tank, and that more air must occasionally be pumped in to take its place. An ordinary hand-

PASSING EVENTS.

A Loss to Society and Automobilmism.

It is only a few weeks ago since it was our pleasant duty to congratulate the late Lord St. Helier, whom the world had for so long and so honourably known as Sir Francis Jeune, on his elevation to the peerage. It is, therefore, particularly tragic that before the great legal experience and unique acquaintanceship with men and affairs the late judge possessed could be placed at the disposal of our final Court of Appeal, the ill-health which caused his retirement from the Court over which he had long so brilliantly presided, should have resulted in his death at a time of life when he might, under ordinary circumstances, have looked forward to a long period of happy usefulness. Lord St. Helier had been for many years one of the most prominent, one of the most able, and certainly one of the most popular of his Majesty's judges. He united in a singular degree the courtliness and charm of manner of a somewhat earlier age, with the open-mindedness and enthusiasm for progress which is characteristic of the best minds of the present day—qualities which made him a singularly successful and attractive host, and a brilliant and sympathetic speaker. That the late judge should have been an enthusiastic automobilist is merely what might, from his general characteristics, have been anticipated, but that, being an automobilist, he should have, on many occasions, proved the eloquent spokesman of the movement and its able advocate with the pen, was the natural result of his mental energy, wide culture, and literary gifts. Like many a great judge before him, Lord St. Helier placed his great abilities unstintedly at the service of his countrymen, his ultimate breakdown in health being largely due to the unremitting energy with which he discharged his legal duties. It must never be forgotten that a great judge is usually making a great public sacrifice, for he could almost invariably, by continued practice at the Bar, make an income to which his emolument as a judge bears but a small relation. In Lord St. Helier's case, energy and great legal ability were tempered and assisted by singular kindness of heart and remarkable tact. He belongs to the class of great servants of the Crown whose untiring devotion to duty has been one of the chief sources of this country's greatness, and the proud consciousness of these facts cannot fail to form the best consolation to the universally popular lady whom he leaves to mourn his loss.

The Explanation of a Mystery.

THE Commissioner of Parks and the Treasury will go to any amount of trouble and expense to maintain in the police courts the legality of the ordinance promulgated by the police limiting the speed of motor cars in the parks to ten miles an hour. The Roads' Improvement Association, indefatigable as usual, seems to have discovered what is the true explanation of this attitude. The roads under what is, by courtesy, termed the management of the First Commissioner, or at any rate, those of them that run through Regent's Park, have been allowed to arrive at such a dilapidated condition that very little more traffic over them will destroy them altogether, and they will probably disappear off the face of the earth. Ten miles an hour, therefore, is probably the maximum that they can endure! A petition has been drawn up by a number of residents in the immediate neighbourhood and presented to the First Commissioner,

urging him to give his attention to the shocking condition of the roads in Regent's Park under his control. The petitioners point out:—

"That the roads were at one time good macadamised roads, but they have gradually been covered with layer upon layer of unclean gravel ballast that has ruined their surface and in some places entirely destroyed their shape. It has been laid down by the best authorities that a road 60 ft. wide should not be more than 8 in. higher at the centre than it is at the sides. In many places on the Regent's Park roads the crown or centre has gone altogether, and the gutters have been filled up with a mixture of gravel and mud. At other places the drop from the road to the gutter is so abrupt that it is a definite danger to bicycles, motor cars and light vehicles. The gravel ballast in question in dry weather turns rapidly into dust, which is a conspicuous feature and nuisance in the park in the summer."

Upon the same subject Mr. Bryce also asked a question some time back in Parliament, and received from Lord Balcarras the reply that "the state of these roads has been engaging the attention of the First Commissioner for some time past. He *hopes* to be able to effect some improvement." The uninitiated might suspect Lord Balcarras of sarcasm. The Office of Works is responsible for the maintenance of these roads. Where it is a case of convicting a few automobilists for going more than ten miles an hour in the parks great energy can be displayed. But where the department is called upon simply to discharge its duty to the public, the most that the responsible official can say is that he *has hopes*, not, be it observed, to put the roads right, or even make them comfortably trafficable, but to effect *some improvement*! And yet people go to the music halls and the comic stage to be amused!

Successful Quibbling.

MOTORISTS have been victorious recently in two rather notable cases in the Divisional Court. The first of these to which we refer, was the appeal of the Earl of Craven on a point of law from the conviction of the Wokingham justices, by whom he had been fined £10 for refusing to give the name and address of his driver. Though the hearing of the case resulted in what is presumably a personal triumph for the Earl of Craven himself, the victory must, we fear, to a certain extent, be looked upon as a Pyrrhic one for automobilists generally. The Lord Chief Justice gave judgment in the appellant's favour on the point of law, but he clearly regarded the appeal to the point of law on which he was compelled to give a judgment in this way as distinctly quibbling. In that we agree with him, although, in the light of previous cases of the same kind, the Lord Chief Justice can hardly be looked upon as very impartial in motor car cases, and his notorious decision in the case of *Mayhew v. Sutton* might of itself have been looked upon by captious critics as a pretty fair example of quibbling.

But Not WISE Policy.

AFTER all it is the effect on public opinion—the way in which the decision will influence the general view taken of motorists as a class, that is the thing that matters. The effect upon an individual is relatively of small importance. It will not benefit the movement, it will not increase the respect which the public generally entertain for car owners of position, if the impression is to get abroad that when their drivers do wrong their masters will avail themselves of any quibble which the Act enables them to take advantage of, to prevent the offenders being brought to justice. In the case in

question there appears little doubt that Lord Craven's driver did actually commit an offence. He did not refuse his name and address nor did he give a false one, but this apparently was because he was going so fast that the police were unable to ask him for it. Under the circumstances one cannot help feeling that they were fully justified in asking for information from the owner, and they only failed on a point of law because, when asking for this information, they did not declare *totidem verbis*, that the driver had committed an offence, only saying that they wanted information "for purposes of prosecution," and this the Lord Chief Justice held was not the same thing. Seriously, we do not think Lord Craven was well advised to stand on punctilio on this point. If the point was one on which we could advise automobilists generally to fight, our view would be different. But where a driver behaves in such a way as to bring discredit upon the movement, the owner certainly ought not to stand upon punctilio for the purpose of preventing his punishment. We trust it will not be generally done.

To sum up our view of the whole situation as succinctly as possible, we would say that where a principle is involved affecting the future of the automobile industry, then wealthy automobilists are acting with public spirit, and for the benefit of their colleagues all the country over, when they fight such matters to the bitter end. But that we cannot approve of fights maintained upon legal quibbles in cases where the police are merely doing their duty, in the spirit if not in the letter, and where the sympathy not only of the general public, but of all right-thinking automobilists, is sure to be on their side. Prejudice against the movement is decreasing both in the Police Force and on the Magisterial Bench, and it is, therefore, a misfortune for a prominent automobilist ever to take up an attitude which is likely to impair the increasing good feeling.

The Motorist Wholly in the Right.

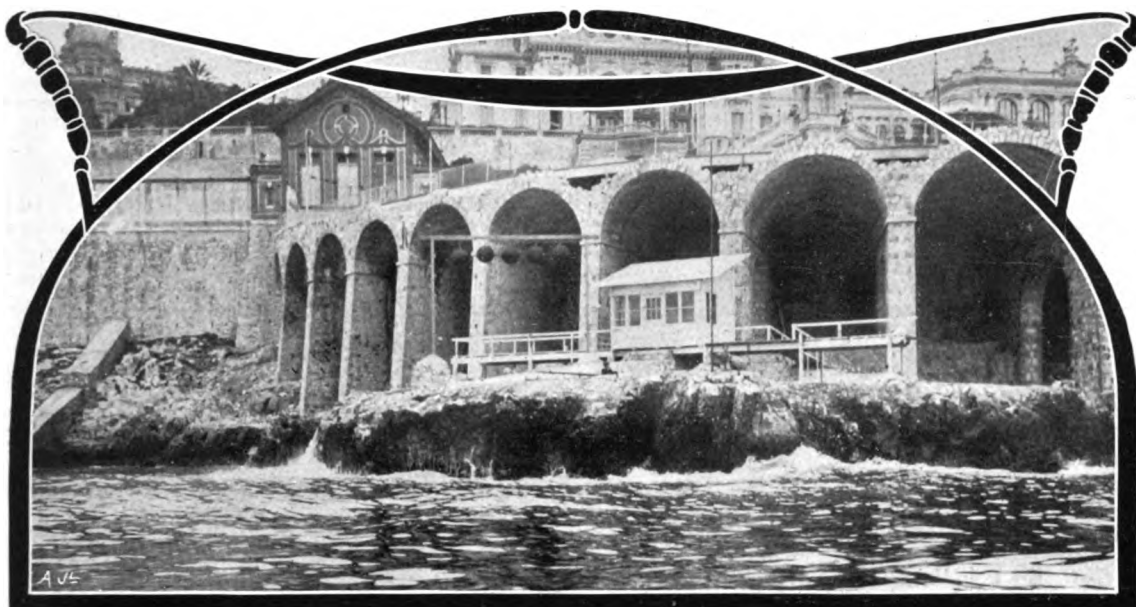
In the second successful appeal to the Divisional Court, the motorist was unquestionably altogether in the right, and there was no suggestion of quibbling or anything of the kind attaching to the defence. There is a bridge over the Stour at Sandwich. For the passage of this bridge tolls are exacted, and they are collected by an apparently somewhat peppery toll-keeper. A Mr. Troughton attempted to cross the bridge one day last summer, knowing nothing about the tolls or the toll-keeper, and had proceeded a short distance when that functionary came up behind him. He refused to pay, and backed his car off the bridge, when the toll-keeper determined to detain on the car, and attempted to seize a cushion, hanging on behind for the purpose of doing so. Mr. Troughton then drove off, with the unwilling passenger behind, who finally relaxed his grasp and fell into the road, suffering, it was alleged, some injuries. For this Mr. Troughton was originally convicted by the local justices for driving to the public danger—an outrageous decision, for, as their Lordships declared in quashing it, the only danger was to the toll-keeper, whose action was quite unjustified, and who was actually at the time a trespasser on the car. Considering that Mr. Troughton originally invited the toll-keeper to take his number, the behaviour of the latter was singularly unjustifiable, and the conviction of the magistrates nothing short of preposterous. In this respect the Divisional Court, at any rate, has proved that it does not exist for nothing.

The True Inwardness of the Tramways Bill.

THE murder is out at last, and it proves to be exactly what we last week suggested that it would be. The present majority on the County Council desire to electrify those of the North London trams which are still drawn by horses, buy them up for the purpose, and, doubtless, ultimately connect them with their southern system across the bridges. This, and this only, can be the explanation of the proposal put before the Council by the Highways Committee, to the effect that £120,000 should be paid to the North London Tramways Company for the remainder of their lease, and £3,314,586 expended on the electrification of the system and the buying up of the horses, cars, and stock. Now one can see the meaning of the petition, and all the rest of the excitement, agitation, and propagandism of the last few weeks. It is all part of a desperate attempt to make the electric tram system pay satisfactorily, not only by extending it still further in the north of the Metropolis, but by linking up north and south together. The matter has to be taken at a rush, for if it is not done soon, it is very probable it will never be done at all, for the electric tram is the representative of the past, the motor 'bus is the representative of the future, and no one can really doubt to which of the two the future lies. But the situation is a pretty serious scandal. Here is a great public body dealing with millions of ratepayers' money, proposing to go to further huge expense at the cost of the ratepayers, and dislocate for a long period the traffic over a large part of the Metropolis, and hurrying the business on because the system that they are intending to adopt is rapidly becoming antiquated. If this is not, in the language of the judge on the Marylebone electric lighting case, "a complete satire on municipal trading," we should like to know what it can be called. That at the same moment the Council are anxious to build themselves "a lordly pleasure house" at the south of the Thames at the trifling cost of £1,700,000 adds that touch of the sublime to the whole situation, which is merely separated from the ludicrous by the narrowest of imaginable partitions.

SOME very amusing speeches were delivered at the recent annual dinner of the Eastern District of the Scottish Automobile Club, at which the Lord Justice Clerk of Scotland officiated as chairman, a good deal of fun being occasioned by Mr. Sheriff Lees declaring that actually a judge on the Bench had confessed to him that he had broken the speed limit for motor cars, but that in the presence of the Lord Justice Clerk he would not mention any names. The Lord Justice Clerk, as usual, was successful in entertaining and amusing his hearers, and it is interesting to note that he gave a word of valuable advice to the Edinburgh Town Council. The extension of the tramway system he regarded as a proof that roads were not what they should be, and that with modern motor vehicles and motor 'buses, where the roads were properly made, there was really no need for the tram. In fact, the Lord Justice Clerk boldly stated that tramways were really as obsolete as the old Sedan chair, and ought in general to be abolished. We trust the Edinburgh Town Council will take the Lord Justice Clerk's advice (instead of wasting the ratepayers' money on enormously expensive electric tram systems)—in which case the Edinburgh ratepayers will have the best of reasons for blessing his name.

MONACO MOTOR BOAT MEETING.

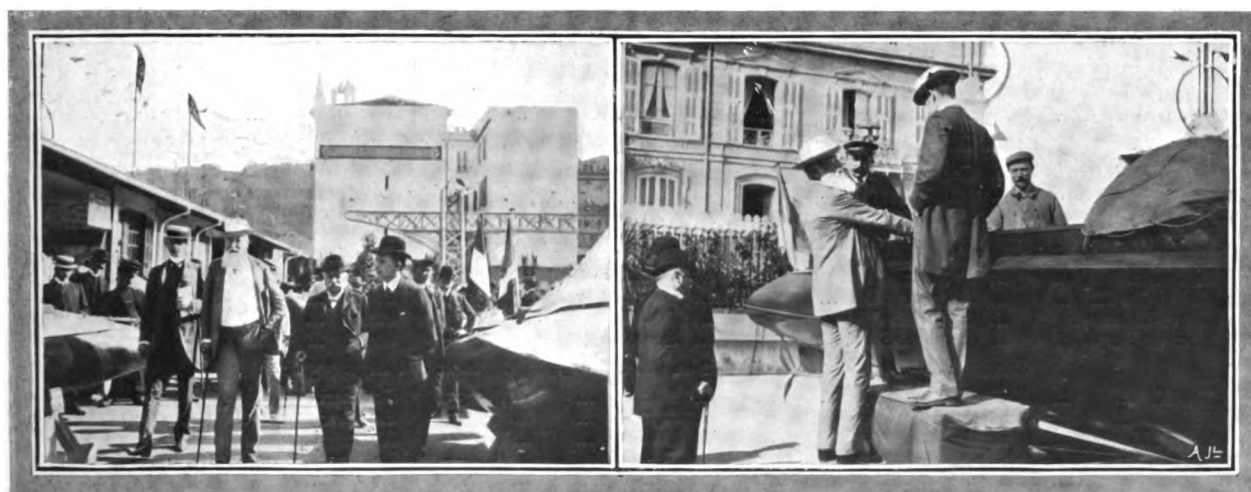


MONACO MOTOR BOAT MEETING.—The official time-keeper's—M. Tampier—box at the starting point.

THE second annual race meeting for motor boats organised by the International Sporting Club of Monaco commenced on Sunday, April 9th, following the conclusion of the Exhibition. In separate tables we give a list of the entered boats which were present at Monaco ready to start in their respective classes, together with some characteristics of each one and their racing numbers.

The first day's programme, which included the events for the first series of racers and first series of cruisers, resulted in a fiasco. Ignoring the warning of the weather

forecast, the officials started the small cruisers at 9.30 a.m. and the racing boats an hour later. The cruisers—which were expected to go from Monaco to Nice and back, a distance of 43 kiloms.—very quickly became involved in a choppy sea, and most of them put into port, either at Beaulieu, Villefranche, or Nice. In fact, only one boat—La Joliette III—completed the course in the proper manner, and this success is attributed more to the capabilities of the pilot than to any special seaworthiness of the boat. These little craft are, of course, very much "fair weather" boats, and although



2 1 3 4 5
King Leopold of Belgium makes a tour of inspection round the Exhibition.

3 1 6 2
King Leopold is keenly interested.

1. King Leopold. 2. The King's Aide-de-Camp. 3. M. Camille Blanc, President of the Exhibition Committee.
4. M. Georges Prade, Editor of "Les Sports." 5. M. Tellier, the famous constructor of boats. 6. M. Perignon, the Captain of the De Dietrich cruiser, and the successful steerer of Tréfle-à-Quatre last year.

MONACO MOTOR BOAT MEETING.

COMPETITORS IN THE MONACO MOTOR BOAT RACES.

No.	Name of Boat.	Owner's Name.	Captain in Command.	Engine.			Hull.		
				Type.	H.P.	Cyls.	Builder.	Length, metres.	Displacement, kgs.

Racers.

CLASS I.—Length under 8 m. (26'2 ft.).

1	Le Gobron	G. Haentjens	Haentjens	Gobron	100	4a	Pitre	7'99	1,100
2	Palaisoto II.	Neubauer et Farman	Anthony	Renault	80	4	Tellier	8'00	1,400
3	La Rapiere	R. Lemaire	Tellier Fils	Panhard	100	4	Tellier	8'00	1,000
4	Janus	G. Gallice	Durand	Janus	100	4b	Le Marchand	8'00	1,200
5	Billancourt	Renault et Pitre	Pitre	Renault	80	4	Pitre	7'99	1,050
6	Madrioto	L. Bermejillo	A. V. Machuca	Renault	80	4	Pitre	7'99	1,050
7	Antoinette I.	M. Levasseur	Latham	Antoinette	120	8c	Pitre	8'00	500

CLASS II.—Length from 8 m. to 12 m. (26'2 ft. to 39'4 ft.).

11	Napier	Lord Howard de Walden	S. F. Edge	Napier	80	4	Saunders	12'00	1,500
12	Napier II.	S. F. Edge	Macdonald	Napier	120	8d	Yarrow	12'00	4 tons
13	Le Suzon-Legru	Legru et Le Blon	Le Blon	Hotchkiss	100	4	Legru	12'00	1,500
14	Palaisoto I.	Neubauer et Farman	Farman	Panhard	120	6e	Tellier	12'00	1,400
15	Baby II.	W. Brooke	M. Brooke	Brooke	50	4	Brooke	30 ft.	952
16	Tréfle-à-Quatre	M. Thubron	Thubron	Richard-Brasier	150	4	Seyler	11'84	—
17	Mercedes-Charley	C. L. Charley	—	Mercedes	180	8f	Pitre	12'00	1,425
18	La Turquoise	Mme. C. du Gast	Mme. C. du Gast	Antoinette	80	8c	Tellier	9'16	550
19	C. G. V.	M. le Marquis de Jessé	Marquis de Jessé	C. G. V.	120	8	Dossunet	10'50	—

CLASS III.—Length from 12 m. to 18 m. (39'4 ft. to 59'1 ft.).

21	Pi-Ouit IV.	M. Damoy-Picon	Maurel	Turcat-Méry	100	8d	J. Guédon	14'91	4,500
22	Le Dubonnet	M. Dubonnet	—	Delahaye	400	4	Tellier	15'00	3,400
23	Panhard	Panhard	Tellier Fils	Panhard	100	8f	Tellier	15'00	1,900

No.	Name of Boat.	Owner's Name.	Type.	Cyl. capy. (litres).	Hull.		
					Builder.	Length (metres).	Beam (metres).

Cruisers.

CLASS I.—Length (maximum) 6'5 m. (21'3 ft.), max. cyl. capy. 2'5 litres.

30	Avenir VII.	G. Filtz et Pitre	Filtz	2'467	Pitre	6'49	1'48
31	Lanturlu	Despujols et Grenié	De Dion	2'389	Grenié	6'50	1'41
32	Muguet	M. Valton	Filtz	2'476	Perre	6'49	1'55
33	La Marguerite	J. Depret	Mutel	2'223	La Marguerite	6'49	1'53
34	Titan VI.	Desmarais et Morane	Delahaye	—	Pitre	6'49	—
35	Joliette III.	Borelly et Sebillé	Beaudouin	2'498	Borelly et Sebillé	6'50	1'41
36	Chantiers d'Antibes I.	Chantiers d'Antibes	Aster	—	Chantiers d'Antibes	6'45	—
37	Delahaye VI.	Desmarais et Morane	Delahaye	—	Chantiers d'Antibes	6'45	—
38	Takumono	W. Miall Green	Blake	2'213	J. A. Smith	6'50	1'46
39	Delahaye V.	Desmarais et Morane	Delahaye	—	Blondeau	6'47	—

CLASS II.—Length from 6'5 m. to 8 m. (21'3 ft. to 26'2 ft.), max. cyl. capy. 3'75 litres.

41	Excelsior VII.	Celle et Picker Moccand	Picker-Moccand	3'741	Celle	7'99	1'6
42	Le Nogentais	M. Caillois	Richard-Brasier	3'740	La Marguerite	7'95	1'6
43	Arion IV.	M. Fayaud	G. Filtz	3'71	Le Marchand	7'99	—
44	Chantiers d'Antibes II.	Chantiers d'Antibes	Aster	2'974	Chantiers d'Antibes	6'95	1'6
45	Chantiers d'Antibes III.	Chantiers d'Antibes	Buchet	3'416	Chantiers d'Antibes	7'00	1'6
46	Titan III.	Desmarais et Morane	Delahaye	3'71	Pitre	7'98	1'6
47	Mets-y-En II.	M. Schetzel	Chenard-Walcker	3'707	Pitre	7'98	1'61
48	Bigort-Delahaye	M. Breton	Delahaye	3'738	Pitre	8'00	1'62
49	Gardner-Serpollet	Gardner-Serpollet	Serpollet (A)	—	Legal	8'00	—

CLASS III.—Length from 8 m. to 12 m. (26'2 ft. to 39'4 ft.), max. cyl. capy. 7'5 litres.

50	Fiat X.	Fiat	Fiat	7'35	Gallinari	8'90	1'737
51	Féfé I.	M. Rumèbe	G. Filtz	7'433	Le Marchand	9'00	1'78
52	Berliet V.	M. Berliet	Berliet	4'666	Rivet	8'50	1'73
53	Rafale	A. Le Marchand	Beaudouin	—	Le Marchand	9'99	—
54	Tétu	A. Jean	Delahaye	7'443	Tellier	8'10	1'63
55	Elise	Alex. Burton	Delahaye	7'443	Chantiers d'Antibes	9'95	1'70
56	Chantiers d'Antibes IV.	Chantiers d'Antibes	J. Filtz	7'486	Chantiers d'Antibes	9'95	1'75
57	Suzette II.	M. Rodze	Beaudouin	—	Borelly et Sebillé	12'00	—
58	Forcès-Pas	A. Cruq	Mors	7'36	Pitre	9'99	1'9
59	Delahaye I.	M. Normand	Delahaye	7'443	Pitre	8'99	1'75

CLASS IV.—Length from 12 m. to 18 m. (39'4 ft. to 59'1 ft.).

61	Rotceh	H. J. Darmaros	Henriod	—	Chantiers d'Antibes	12'15	—
62	Dietrich II.	M. Pérignon	De Dietrich	12'465	La Marguerite	12'40	2'2
63	Jeannette	P. Jafropulo	Beaudouin	—	Le Marchand	12'50	—
64	Mercedes C.P.	C. L. Charley et Pitre	Mercedes	11'974	Pitre	13'99	2'4

Yachts.

Length from 18 m. to 25 m. (59'1 ft. to 82 ft.).

71	Mercédès-Mercédès ...	Jellineck-Mercédès ...	Mercédès ...	—	Pitre ...	18'50	—
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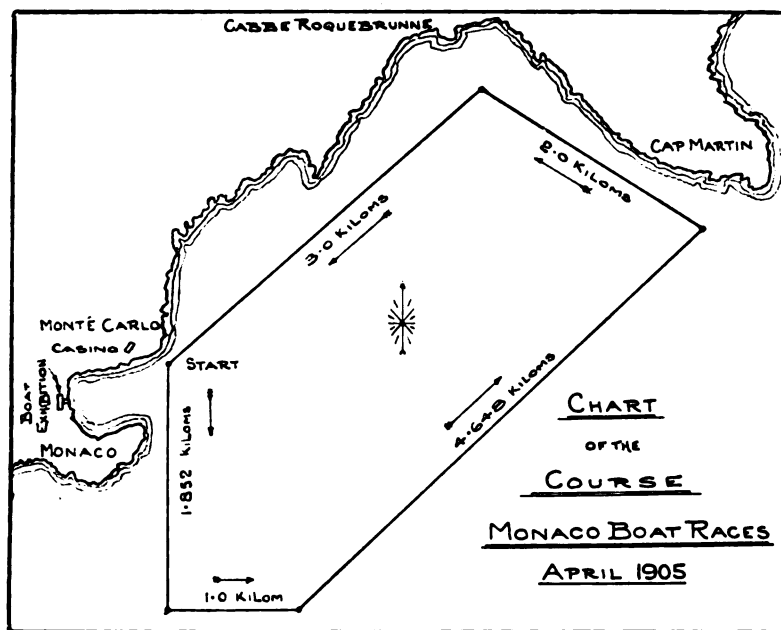
Pinnaces.

81	Héracles III. ...	Héracles ...	Héracles ...	—	Pitre ...	5'50	—
82	Dalifol ...	Dalifol et Seyler ...	Abeille ...	—	Seyler ...	6'50	—
83	Yvonne ...	E. Blanc ...	Delahaye ...	—	Blondeau ...	6'50	—

Fishing Boats.

91	Henriette ...	N. Person ...	Delahaye ...	—	Pitre ...	8'50	—
92	Hercules II. ...	Héracles ...	Héracles ...	—	Pitre ...	10'00	—
93	La Physalie ...	S.A.S. le Pr. de Monaco ...	Pascal ...	—	X. à Roscoff ...	10'00	—

(a) Engine has eight pistons. (b) Engine has eight combustion chambers. (c) Cylinders are inclined in the form of a V. (d) Two 4-cylinder engines side by side. (e) Two 3-cylinder engines in tandem. (f) Two 4-cylinder engines in tandem. (g) One propeller slightly behind the other. (h) Fitted with a reversible propeller. (i) Steam.



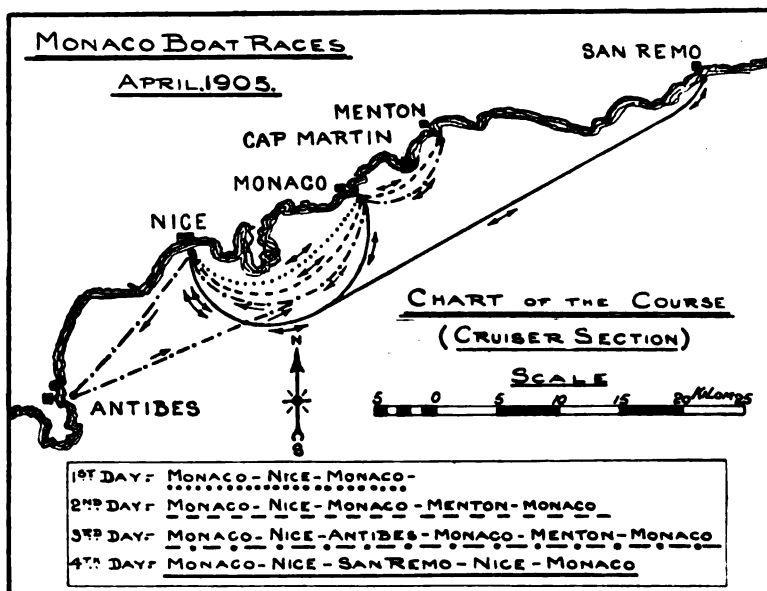
tugs were sent to their assistance. With one of these "Le Gobron" collided, and was brought to port in a sinking condition. The committee, who have been subjected to considerable censure for want of forethought in the arrangements, declared the race off, and decided that it should be re-run on the next day—Monday—but fate, in the form of the weather, was again against any races being held. With regard to the cruiser race on Sunday, they nominated "Joliette III" as the winner, and expressed their intention of holding an enquiry as to the behaviour—during the time they were storm-bound along the coast—of the other boats which finished.

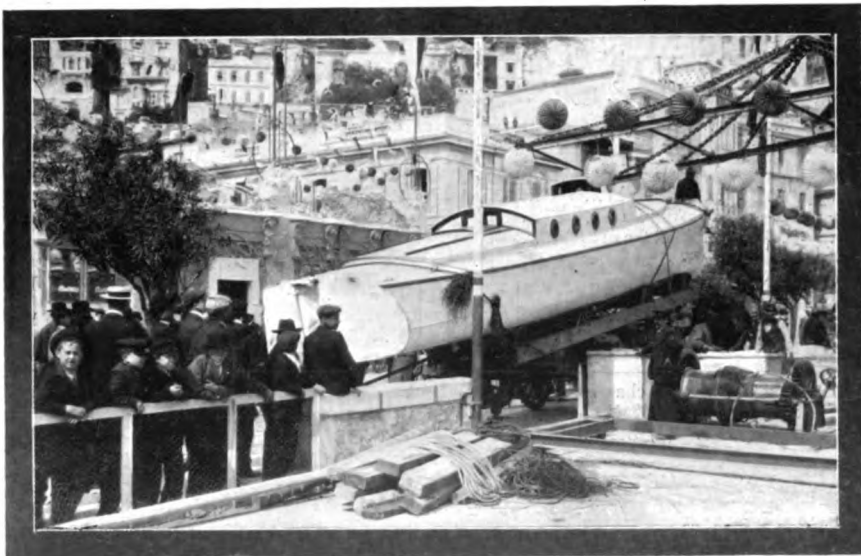
The hopes of Sunday were by no means realised on Monday, for a high sea was running all day. Just for a little while, in the afternoon, it looked as if things might improve, but at best it was a poor chance, and it was obvious that the races were off for the day. One or two boats were sufficiently venturesome to put out for a trial, but they quickly sought shelter again, having realised the unnecessary danger they were courting. Later on the rain came down in torrents, and the wind dropped suffi-

delightful for smooth water, they undoubtedly require better handling to keep them afloat in a choppy sea than the majority of their pilots are likely to be capable of.

Among the competing cruisers was Mr. Miall Green's "Takumono." This, the only English boat, had to put in at St. Jean, but later in the afternoon it finished the course, as did two others, viz., "Delahaye VI" and "Lanturlu." In all, therefore, there were four boats which crossed the finishing line. "Joliette III" arrived at 12 h. 55 min. 4 secs.; "Delahaye VI" at 5 h. 16 min. 14 secs.; "Takumono" at 5 h. 18 min. 59 secs.; and "Lanturlu" at 5 h. 27 min. 18 secs., the first-named only, however, being, it is suggested, entitled to be classed. Of the others, "La Marguerite" has suffered most, for she is a wreck off Cap d'Ail. A wave put her engine out of action, and the boat, then beyond control, drifted on to the rocks, the pilot, M. Depret, and his mechanic getting safely ashore, thanks to the timely aid of some Customs-house officials who were on the scene.

Nor did the racers fare any better, for they were so soon in difficulties that





MONACO MOTOR BOAT MEETING.—Transferring one of the cruisers from the Exhibition to the sea.

won by "Excelsior VII.," a Swiss boat belonging to Celle and Picker-Mocand. "Le Nogentais" was second, and "Bigort-Delahaye" secured the third place.

The event of the day—in fact, the event of this year's Monaco meeting—then took place, the racers of Class II. being despatched on their 100 kilom. trial. The starters in this event included three English boats, viz., "Napier II.," "Napier," and "Baby II." The first to get away was "Mercedes-Charley," and her speed was certainly worthy of the expectations to which she had given rise.

Following the "Mercedes" boat was the "Napier," steered by S. F. Edge, Lord Howard de Walden being prevented, by illness, from piloting his own boat. "Palaisoto I." followed the "Napier." Close



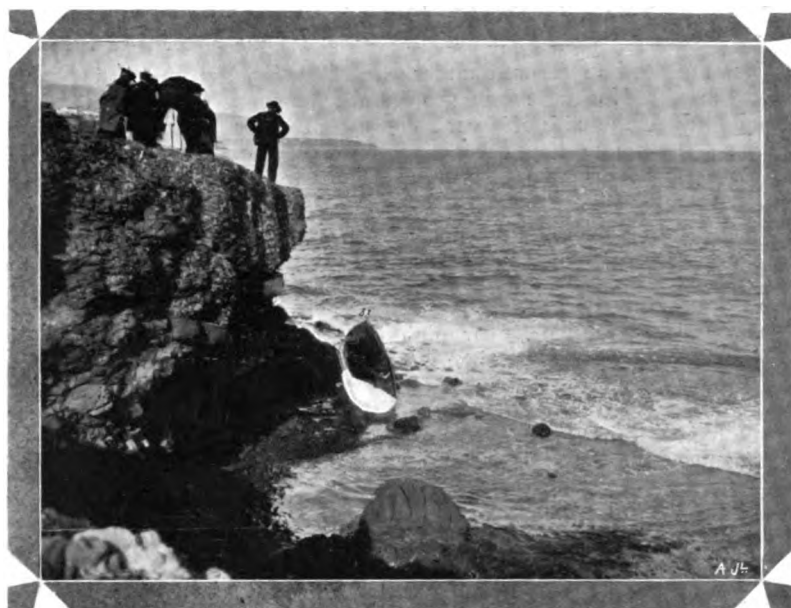
MONACO MOTOR BOAT MEETING.—The Prince of Monaco, accompanied by Prince Ferdinand of Bulgaria, on his visit to the Exhibition, studying the special features of "Héracles III."

ciently to revive the hopes of the competitors that events might take place on Tuesday. All day long the shore reverberated with the sound of the engines, the majority of which were kept running. During the morning an unfortunate collision occurred between the "Napier" and "Palaisoto," resulting in a damaged hull for the latter. The "Napier"—which has just been purchased by Lord Howard de Walden—was, however, quite uninjured.

Better fortune favoured the competitors on Tuesday, for the sea, which had already calmed down on the previous evening, remained in a suitable condition for continuing the events. The weather was still wet, however, and this prevented the spectacle being as enjoyable as meetings of the kind in the Riviera almost invariably are. At 9.30 a.m. the cruisers in Class II. were started over the course from Monaco to Nice and back, then to Mentone and return to Monaco. This race was



MONACO MOTOR BOAT MEETING.—A corner of the Exhibition.



MONACO MOTOR BOAT MEET.—"La Marguerite" on the rocks at Cap d'Ail. This sturdy little vessel, the property of M. Depret, her engines becoming disabled on the return course from Nice, was unable to battle against the heavy seas and was at last driven on to the rocks.

behind came "La Turquoise," with Mme. du Gast at the helm. "Baby II." was in front of "Le Suzon-Legru," and this Hotchkiss-engined boat was followed by "Napier II.," in the hands of Macdonald, "C.G.V." bringing up the rear. "Trèfle-à-Quatre," of which so much was expected as the holder of the B.I.C., failed to start.

The spectators on the terrace had their enthusiasm over this race in no way lessened by the abominable weather. The British section, however, were obviously disappointed at the outset by the position of "Napier II." "Mercedes-Charley" still led at the end of the first round, and the Napier had given way to "Palaisoto I." and "Napier II.," which were second and third respectively. "Napier II." then passed "Palaisoto I.," and thus followed "Mercedes-Charley" at the end of the second lap. To the surprise of everyone the leading boat then gave up, and returned to port. It subsequently transpired that hot bearings had made it impossible for her to continue the race. "Napier II." had thus the leading place, and as "Palaisoto I." subsequently broke down, too, the Napier followed with second position. "La Turquoise" was the next to break down, and the final result was that "Napier II." won the race in 2 hrs. 25 mins. 54 secs., "Napier" was second, "C.G.V." third, "Le Suzon Legru" fourth, and "Baby Brooke II." fifth.

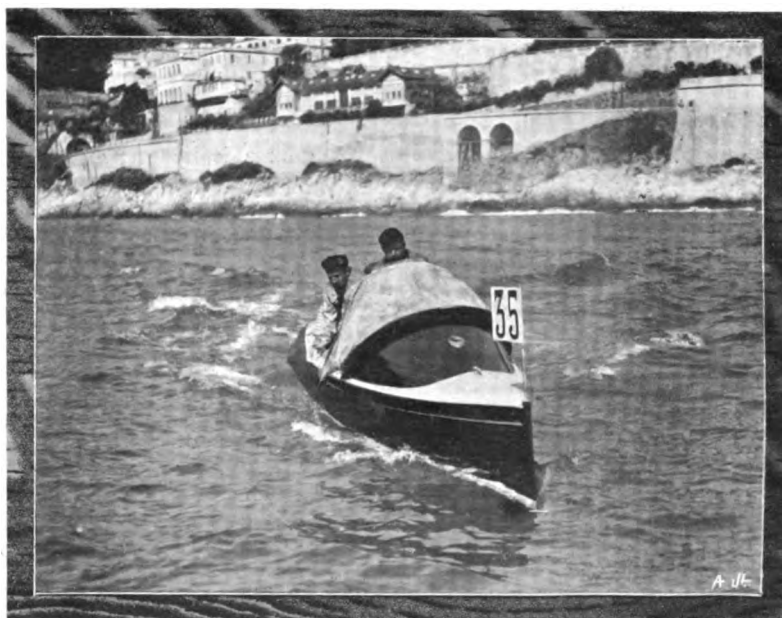
As an international event it was a huge success for English builders. Out of the nine boats which came up to the line, three only were English.

Only five of the nine finished, three of which were English. Although "Baby II." was last, her constructors, J. W. Brooke and Co., are deserving of congratulation on her performance, for in engine power she is rated far and away below that of the weakest of her competitors.

The following table shows the times taken per lap by those boats which completed the race :—

Lap	Napier II., 2 h. 25 m. 54 s.	Napier, 2 h. 46 m. 18 s.	C.G.V. 3 h. 20 m. 28 s.	Suzon-Legru, 4 h. 20 m. 21 s.	Baby II., 4 h. 55 m. 25 s.
	m. s.	m. s.	m. s.	m. s.	m. s.
1	17 20	19 40	27 42	41 5	38 7
2	17 29	24 53	25 32	36 8	33 49
3	16 28	24 13	24 41	42 9	53 9
4	16 54	18 44	24 48	41 43	38 58
5	17 17	20 0	24 37	37 10	29 31
6	18 6	19 21	24 21	21 17	33 47
7	19 59	19 42	24 28	21 10	33 50
8	22 9	19 45	24 19	21 39	20 0

In the afternoon, the event for the racers of Class I., postponed from Sunday, took place. Four boats started, and all of these finished. From the beginning "La Rapiere" showed to advantage over the others, and she eventually won the race by just under 20 minutes. The total times for this event were :—1st, "La Rapiere," 2 hrs. 26 mins. 30 secs.; 2nd, "Bilancourt," 2 hrs. 46 mins. 20 secs.; 3rd, "Antoinette II.," 2 hrs. 47 mins. 34 secs.; 4th, "Palaisoto II.," 2 hrs. 53 mins. 52 secs.



MONACO MOTOR BOAT MEET.—"Joliette III," the only cruiser on the first day which, owing to the fearful weather encountered, succeeded in finishing the course in time to be entitled to be classed under the rules.

AN AUSTRALIAN RELIABILITY TRIAL.

THE increasing interest in motoring taken by the inhabitants of Australia has had its natural outcome in a Reliability Trial, which has just been concluded—the main particulars relating to which we gave some months ago. The trial—promoted by the Dunlop Tyre Company—was held on the five days ending February 25th, and consisted of a run from Sydney to Melbourne, a distance of 572 miles. The five daily journeys were of approximately equal distances; on the first day the run from Sydney to Goulburn covered a distance of 129 miles, on the second and third days the cars journeyed 121 miles, from Goulburn to Gundagai, and from Gundagai to Albury respectively, while the distance covered on the fourth day was 101 miles, from Albury to Euroa, and the final run to Melbourne, on the fifth day, was over a distance of 100 miles. Of the total route, shown graphically in the official map, which we reproduce, 343 miles was officially described as good road, 140 miles as second

time allowed under the rules for each particular run. Not more than 250 points, however, were deducted in the case of a car completing the journey by 9 p.m. The time limits were equivalent to an average speed of 15.6 m.p.h., and 13.6 m.p.h. for the "heavy" and "light" cars respectively. No advantage was gained and no penalisation was enforced by arriving at the destination too soon, but, on the other hand, there was no speed limit—except through control towns—and as repairs, &c., could be carried out *en route*, without prejudice, a car might give a good deal of trouble and yet not lose time marks if it was capable of making up for any delay when once again going properly.

Motor cycles were subject to similar conditions, but only machines with a cylinder capacity of not more than the equivalent of 3½ in. bore by 3½ in. stroke were eligible.

Thirty-three competitors started off from Sydney for the five days' run, twenty-nine reached Goulburn,



SYDNEY-MELBOURNE CONTEST.—Coming into Coburg Control.

rate, and only 89 miles as bad road. The course is by no means all easy going, and provided a suitable test route, and also a very fair trial of hill-climbing capacity, particularly in the New South Wales district, which is distinctly mountainous country.

The contest was not supposed to be a race, and it was organised by the Dunlop Company with a view to its becoming an annual event; the idea being to start the trial alternately from Sydney and Melbourne each successive year. Both cars and motor cycles could be entered, but the car section was only open to members of the automobile clubs of Australia. For motor cars the Buchanan Cup was the chief award, and for motor cycles there was the Kelmsley Cup. The cars were divided into two classes by weight, light cars to weigh 1,200 lbs. or under, heavy cars to be above 1,200 lbs., but both classes to be unlimited as to horse-power. Each car had to carry one passenger besides the driver.

The method of marking was, in one particular, not altogether commendable. A maximum of 500 points was allotted for each day's run, and one point was deducted for every minute in excess of the maximum

twenty-eight arrived at Gundagai, twenty-six got as far as Albury, twenty-three made Euroa, and twenty-one completed the total journey. Of those which were driven right through, four heavy cars, three light cars, and two motor cycles scored full points. These competitors, thus tied in their respective classes, and it was, therefore, necessary to hold an additional "non-stop" run to decide finally the winner of the Buchanan Trophy.

This final "run-off" trial was carried to a successful issue on March 6th over a course from Melbourne to Ballarat and back, a distance of 140 miles. Somewhat more decisive regulations governed this event than had been the case in the five days' run, one point being deducted for every minute lost by the stoppage of car or motor cycle. An official was placed aboard each car to record stops, while each cyclist was accompanied by two official motor cyclists. Besides having to make a non-stop run, the light cars had to cover the distance in 8 hrs. 45 mins., an average of 16 miles per hour, and the heavy cars were allowed only 7 hrs. 20 mins., an average of 19 miles per hour. The two motor cyclists were allowed 7 hrs. 30 mins. in which to do the journey, an average of slightly under

changes of speed. The rod, U, engages with the wheel, S², and the rod, U¹, engages with the wheels, S¹ and T¹. Both these rods have neatly-arranged catches inside the gear-box for holding them in either of their normal positions, these catches consisting of steel balls, which are pressed up against the rods by springs, so that the balls engage in slots in the rods.

The two rods, U and U¹, are connected with the two sleeves, U², by lever-arms as seen, and the change-speed-lever is fixed to another sleeve, U³, that also rides about the brake-shaft, V, but is free to slide along it, as well as to rock about it. The sleeve, U³, has jaw-clutch-members, U⁴, at each end, one of which is visible in Fig. 11, these being arranged in such a way that the sleeve, U³, can be made to engage with either of the sleeves, U², by moving it along in the one direction or the other. The quadrant for the change-speed-lever has two parallel slots, with a central "gate" for the lever to pass across from one to the other, and thus when the lever is in its neutral position it can be moved sideways together with the sleeve, U³. By moving it forwards or backwards in the one slot, it introduces the "third" or "fourth" speed, or, in the other slot, it gives the "reverse" or "first" speed. To avoid any risk of introducing the "reverse" gear unintentionally at any time, the lever is provided with a small hand-catch that normally prevents it from being moved into that position.

All the wheels in the gear-box are of large size, as also are the bearing surfaces. The differential countershaft has three bearings inside the box, and there are ball-thrust bearings behind each of the bevel wheels, while, as already mentioned, the extreme ends of the differential shafts are fitted with special ball bearings that are fixed to the side members of the frame, these bearings being of the same make as are the hubs for the road wheels.

The Regulating Levers and Pedals.

The means provided for controlling the car only differ from ordinary practice in one important respect, for the two side levers (for the hub brakes and for the gear), and the two pedals (for the clutch and for the countershaft brake), are placed in the usual positions, and there is an accelerator pedal for increasing the normal engine speed that is maintained by the governor. The unusual feature is the arrangement of the single hand-lever above

the steering-wheel, in such a way that it moves over a stationary quadrant, W¹, and that it not only acts on the independent throttle-valve, H, in the induction pipe, but—after having fully opened that valve—commences to act on the governor-gear, in just the same way as does the accelerator pedal. The construction of the steering-pillar is shown in Fig. 12, where it will be noticed that the quadrant, W¹, is fixed to the upper end of a tube, W², which passes down inside the pillar, and is, at its lower end, rendered rigid with the casing enclosing the steering-gear by the bracket, W³. The hand-lever, W, is, of course, fixed to the central rod which connects it with the lever-arm, W¹, that lies beneath the bracket, W³. The "timing" lever for the ignition is, as we have said, attached to the dashboard.

Table of Reference Letters for the 35-h.p. Brooke Car Illustrations.

<i>The Ignition Gear.</i>		N ¹ Operating cam for clutch-ring.
A Low-tension igniters.	N ² Rock-shaft carrying cam, N ¹ .	N ³ Operating-lever fixed to M ² .
A ¹ External rocking-arm for same.	N ⁴ Roller on N ³ .	N ⁵ Counterbalance weight for N ³ .
A ² Cam-shaped projections.	N ⁶ Expanding clutch-ring.	P ¹ "Carrier" projection on same.
A ³ "Make" spring.	P ² Stud securing P ¹ to N.	
A ⁴ Studs for igniters.		<i>The Change-Speed-Gear.</i>
B Sliding "timing" rods.	Q "Driving" wheel in gear-box.	Q ¹ Short shaft for same.
B ¹ Guides for same.	R "Driven" wheel on lay-shaft.	R ¹ 1st speed spur-wheel on same.
B ² "Timing" rock-shaft.	R ² 2nd speed spur-wheel on same.	S "Driven" shaft carrying bevel-wheel.
B ³ Pivoted operating-levers.	S ¹ 1st speed and "reverse" wheel on shaft, S.	S ² 2nd and 3rd speed wheel on same.
B ⁴ Rollers on B ³ .	S ³ Intermediate "reverse" wheel meshing with S ¹ .	T Sliding intermediate wheel meshing with R ¹ .
B ⁵ Safety springs.	T ¹ Sliding rod for 2nd and 3rd speeds.	U Sliding rod for 1st and "reverse" speeds.
C Vertical operating rods.	U ¹ Sliding sleeve fixed to gear-lever.	U ² Jaw-clutch members on U ³ .
C ¹ Springs for same.		<i>The Control Gear.</i>
C ² Wedge-shaped levers on same.	V Rock-shaft fixed to brake-lever.	W Hand-lever controlling engine.
C ³ Guides for rods, C.	W ¹ Stationary quadrant for same.	W ² Tube-carrying quadrant, W ¹ .
D Upper guides for rods, C.	W ³ Bracket holding tube, W ² .	W ⁴ Lever arm connected to hand-lever, W.
D ¹ Studs for same.		
<i>The Carburettor.</i>		
E Induction pipe.		
F Main air supply.		
G Governed throttle-valve.		
G ¹ Ports for same.		
H Hand-controlled throttle-valve		
K Auxiliary air valve.		
K ¹ Atmospheric piston for same.		
K ² Spring for same.		
K ³ Auxiliary air ports.		
<i>The Main-Clutch.</i>		
L External clutch-member.		
L ¹ Rim of fly-wheel.		
L ² Hollow crank-shaft.		
M "Driven" clutch-shaft.		
M ¹ Coupling flange on shaft, M.		
M ² Steel plates for flexible coupling.		
M ³ Sliding cone on shaft, M.		
M ⁴ External clutch-spring.		
M ⁵ Groove for clutch-fork.		
N Ball-thrust-bearing for same.		
N ¹ "Driven" clutch-member.		

As an example of the growing employment of automobiles for electioneering purposes, it may be mentioned that no less than 110 motor vehicles were employed during the Brighton election on behalf of the Unionist candidate alone.

A VERY commendable departure has been made by Mr. C. W. Bradley, the engineer and surveyor to the City of Westminster. The season and the summer are approaching, when London is at its best and fullest, and when it is accordingly customary to tear up our principal streets and re-pave them, so that visitors from the country may realise what a progressive city the Metropolis is, and also have opportunities of observing the leisureliness of the British workman during his public employment, and the punctiliousness with which he insists on occupying his full allotted time for meals and relaxation. The care for the ratepayers' money, too, displayed by the various municipalities concerned in steadfastly refusing to employ double shifts of labourers is another

point which can scarcely fail to excite the admiration of visitors from a distance. Mr. Bradley, however, is determined to do what in him lies to mitigate the nuisance occasioned to London, in this respect, by announcing beforehand when the principal streets in the jurisdiction of his council will be closed to traffic and opened to repairing operations. It is to be devoutly hoped that the various public bodies to whom our Legislature has given the power to tear up our streets for their own purposes where and when they think fit, will arrange as far as possible to perform what operations they may need to execute during the dates which Mr. Bradley announces beforehand. In that case we may be saved the time-honoured spectacle of the employees of a gas or electric lighting company hurrying to the spot from which the labourers of a Corporation have just retired, encouraging each other to the attack on the newly-laid asphalt by the war cry—"Have it up, boys, before it gets hard!"

HILL-CLIMBING AND HORSE-POWER.

MR. J. R. WADE, ex-Hon. Sec. of the Sheffield and District Automobile Club, wrote us on March 20th the letter which we publish below with regard to the question of calculating the horse-power of motors for the purposes of hill-climbing competitions, such as those that are held by his, and by other, provincial clubs.

We publish this letter, with Mr. Wade's consent, together with our reply to him of March 23rd, because we have reason to believe, from the numerous letters that we have received on the subject each season, that this correspondence may prove useful to a wide circle of our readers, as well as to many of those gentlemen who, like Mr. Wade, have undertaken the extremely difficult task of drawing up satisfactory rules for these hill-climbing events. It is a knotty question at best, but, since it is evident that a number of such club events are to again take place this year, it is as well that the subject should receive a further airing, and that motorists should be in a position to judge for themselves as to the value of the results in each case.

The following is the text of Mr. Wade's letter:—

"As handicapper for our hill-climbing competition, may I trespass on your time, and ask you to kindly enlighten me as to the correct method of arriving at horse-power of motors when the bore, stroke, pressure, and revolutions are given, viz. :—

"1. I have your 1902 Pocket Book before me, and would like to know what you mean (on page 161) by 'negative work is neglected in these formulæ for explosion engines.'

"2. What is the 'average pressure'?

"3. Does a motor 4 ins. bore \times 4 ins. stroke, 70 lbs. pressure, 1,000 revs., 4 cylinders, work out thus (according to No. 3 i.h.p. on page 161) $0.000119 \times 4^2 \times 70 \times 1,000 \times \frac{4}{12} \times \text{No. of cylinders}$, and = 17.77?

"I have every reason to acknowledge your courtesy in the past, and trust you will favour me again."

The following is a copy of

OUR REPLY.

"In answer to your letter of the 20th, and replying in the first place specifically to each of your three questions:—

"1. The 'negative work,' referred to in our Pocket Book, is that furnished by the flywheel during the non-working strokes of the piston in the cylinder, in order to draw in the charge on the suction-stroke, and to drive out the exhaust gases during the exhaust-stroke. It is difficult from an indicator-diagram to measure the value of this negative work when working out the mean pressure on the piston, and that is why the note to which you refer was appended to the formula in the Pocket Book.

"2. The 'average pressure' which is ascertained from an indicator-diagram obtained from the engine, is the mean pressure in lbs. per sq. in. exerted upon it during the firing-stroke. Since, however, negative work is being done during the whole of the compression-stroke, and this is also represented on the diagram, it is customary to deduct the compression pressures from the explosion pressures when calculating this mean effective pressure. Its actual value in practice (in lbs. per sq. in.) varies considerably in different makes of engine, chiefly because a higher compression is employed on some than on others, but also because valve-diameters, inlet and exhaust-pipe dimensions, and numerous other things, differ considerably.

"3. The calculations which you have made would be quite correct if 70 lbs. per sq. in. were the 'mean average pressure' upon the piston during the firing stroke, minus the 'mean average pressure' on it during the compression stroke, but we think in all probability that an error has been made by mistaking the 70 lbs. compression for 'mean average pressure.' If this be so, all that the 70 lbs. implies is, that the clearance space behind the piston, when it is at its dead centre, bears such a relationship to the stroke that the explosive mixture taken in during the suction stroke is compressed to 70 lbs. per sq. in. by the time the compression stroke is finished.

"The formula to which you refer is in any case only applicable for arriving at the 'indicated' horse-power of an engine, which merely shows the amount of work which is done on the pistons, and must

obviously be considerably in excess of that obtainable from the crank-shaft—the friction of the pistons and other moving parts naturally absorbs a good deal of work.

"We are perhaps the worst people in the world to apply to for assistance in preparing hill-climbing formulæ of the kind required, being fully convinced that it is an absolute impossibility to obtain any formula which is in any sense accurate, or is, in fact, other than misleading for such competitions. In the first place, it is extremely difficult to define what it is that should determine the winner, for obviously the car which has the most powerful engine in relationship to its weight will make the shortest time, and therefore be the best hill-climber, if the transmission gear is reasonably efficient. Satisfactory hill-climbing competitions would, therefore, only be possible between vehicles of approximately the same class, if the best hill-climber were allowed to be the winner. Once depart from this standpoint in order to endeavour to allow totally different types of vehicle to compete against one another, it is purely optional as to what relative values are given to the differences that exist between them, and therefore it is, after all said and done, chiefly a matter of fancy—apart from chance or good driving—as to which is ultimately the winner.

"Perhaps the real difficulty in framing anything like a satisfactory hill-climbing formula, is that the speed of the engine is an unknown quantity, for, in the first place, the makers' figures are scarcely reliable, and, even if they were, the actual engine-speed at any time depends—even in the hands of the best of drivers—on the extent to which the gear-ratios happen to suit the particular gradient. If a hill-climbing competition were intended to show which car had the most efficient transmission-gear, the most convenient gear-ratios for the purpose, and the most skilful driver, the best way of determining the winner would be in reality—although this is impossible—to take a brake h.p. test of the engine separately, in order to ascertain the highest power that it was capable of giving at a not unreasonable speed, and to then handicap cars in proportion to this power, and, at the same time, in inverse proportion to their actual running weight.

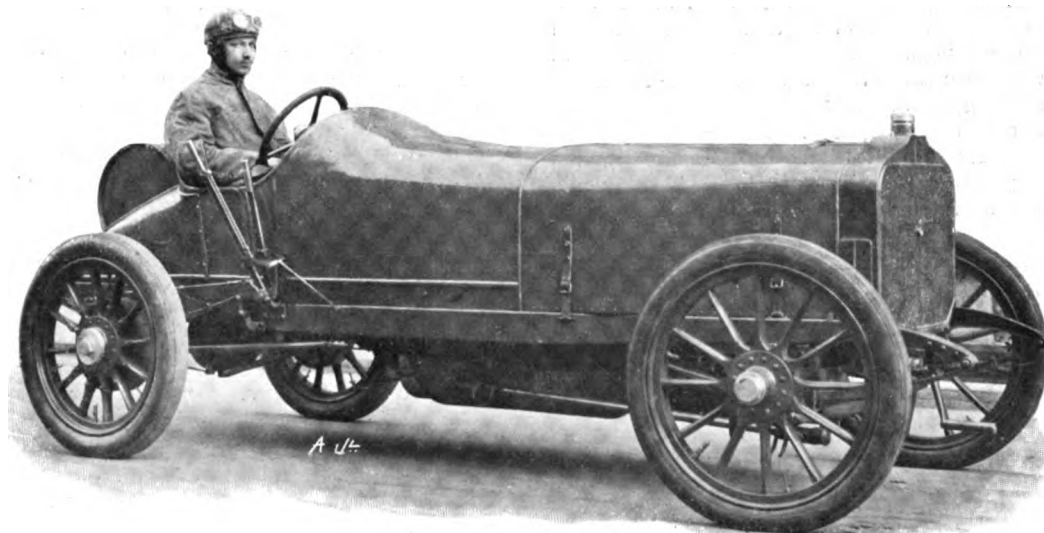
"In practice, however, perhaps the nearest approach that can be got to the ideal for such events as that now in question, is to assume that the normal engine speeds given by the makers are correct, and to then assume that a certain number of cubic inches of piston displacement per minute, represent 1-h.p. To arrive at this quantity, it is only necessary to multiply the total area of the pistons (in square inches) by the stroke (in inches), and by the engine-speed. This gives the number of cubic inches per minute of piston displacement, and should be equivalent to twice the quantity of explosive mixture taken (by 4-stroke or Otto cycle engines), when the engine is working at full load. As already mentioned, different engines vary in the actual b.h.p. that they give in relationship even to 'piston displacement per minute,' but we do not think that manufacturers or owners would have much cause for complaint, if it were laid down in the rules that the horse-power of the engines would be calculated on the basis of 10,000 cubic inches piston displacement per minute for each horse-power.

"In connection with the Hereford Trials last year, the analysis which we made showed that for engines having a normal speed of over 1,000 revs. per min., 10,725 cubic inches per minute was the average for each declared h.p., and that the corresponding figure for engines of lower speed than that was 9,200. Of course, all the cars taking part in that event were small ones, but, from comparisons that we have made with other events, we think you would be safe in taking the 10,000 figure mentioned. On this basis an extremely simple formula can be used, for it is merely necessary to take the weight of each car with its passengers, and to divide this (1) by the time taken in climbing the hill, and (2) by the h.p., as arrived at in the above-mentioned manner. Naturally, the weight can be taken in cwts. or in lbs., the time in minutes or in seconds, just according as to whether the resultant figures are required to be large or small, or a 'constant' can be inserted either as a denominator or as a divisor (provided that it has a multiplication sign before it) for a similar purpose.

"Hoping that this will be of use to you, and regretting that it is unavoidably lengthy in order to ensure lucidity."

THE Daimler Motor Company, Coventry, have again been honoured by Royalty. The Princess of Wales has ordered from them a new 28-36-h.p. chassis with a wheel base of 10 feet, which is to be fitted with a special brougham type of body, giving seating accommodation for five.

RACES, RECORDS, AND TRIALS.



A Clement-Bayard Racer, one of the two entered for the Gordon-Bennett French Eliminating Trials.

GORDON-BENNETT CUP RACE.

THE date for the British Eliminating Race in the Isle of Man has, at the request of the A.C.G.B.I., been altered by the Governor of the Isle of Man from May 23rd to May 30th.

This will, of course, also refer to the Auto-Cycle Club events arranged over the same course.

PROPOSALS have been put forward for publishing regular betting quotations of the odds for or against the various competitors in the Gordon-Bennett Race similar to those published in the sporting and daily papers in connection with horse-racing. We cannot say we like the idea. It is calculated ultimately to have a very deteriorating effect on the character of motor-racing as a sport. Far from benefiting horse-racing, there can be no doubt whatever that betting has injured it, and automobile-racing from its very nature would be likely to be injured considerably more.

The Clément-Bayard Racers.—In general appearance the new Clément-Bayard racers have not altered greatly from those of last year. The illustration on this page—which is from a photograph of the particular car which will be driven in the French Eliminating Trials by A. Clément, jun.—shows that the racer still has the same “all-bonnet” appearance, owing to the use of a metal wind shield extending from the back of the bonnet to the sides of the seat, but it will be noticed that a honeycomb radiator has been substituted for the coil type previously employed.

The car is of the live-axle type, and has a 4-cylinder engine, which is stated to be capable of developing 120-h.p. The frame is of pressed steel, and is carried on semi-elliptic springs, and those at the rear lying outside the frame. The rear springs have shackles at both ends, and the axle casing is tied to the main-frame by radius-rods. The 4-cylinder engine has a bore-and-stroke of

160 mm., and the mechanically-operated valves are arranged on either side of the engine.

The chassis has a wheel-base of 2.75 m. (9 ft.), and a track of 1.35 m. (4 ft. 4½ in.). The rear wheels are shod with 820 mm. by 120 mm. tyres, but 810 mm. by 90 mm. tyres are used on the front wheels.

The Tourist Trophy—a Preliminary Trial.—No doubt many of those who have entered for the Tourist Trophy will follow Mr. S. F. Edge's example of holding consumption trials of their vehicles prior to that event. Mr. Edge has recently been testing an 18-h.p. Napier over the Dashwood Hill road, and has sent us the following particulars of the trials.

After making a few preliminary runs which, although satisfactory, were considered by Mr. Edge to be capable of improvement, the car was loaded to conform with the rules of the Tourist Trophy Race, by filling the tonneau with bags of sand to the total weight of 300 lbs. The car, with one passenger besides the driver, was then taken 19 miles out of London, and after all the petrol in the pipe and carburettor had been drained off, exactly a gallon of petrol was poured into the special tank which had been fitted for these trials. Starting from the 19th milestone, the car ran to three-quarters of a mile past the 43rd milestone before the petrol gave out—a distance of 24½ miles, which included the climb up Dashwood Hill. After again filling up with another gallon of petrol, the car ran from the 44th milestone to the 52nd, and returned to the 34th—a distance of 26 miles, which did not include the descent of Dashwood Hill. Two other runs, over a different course, were then made, and the average of the four tests was 25.75 miles per gallon. Since last week the entries have nearly reached the half-hundred, four additional cars having been officially entered, bringing the total to 47. These are: Mrs. John Bennett-Stanford (Dixi), Mr. Charles Jarrott (two Crossleys), and Mr. D. Citroen (Minerva).

Scottish Reliability Trial.—The following are the entries up to the 5th inst. for this Trial, taking place on 10th, 11th, 12th, and 13th May next, under the auspices of the Scottish A.C. (Western Section). A slight modification on the route as originally announced has been made, and the cars will stop on the third night in Pitlochry, and proceed thence via Ballinluig to Aberfeldy, instead of crossing from Struan to Aberfeldy and resting there, as was originally suggested.

The total entries, so far, it will be seen, are 44, viz., Class A, four; Class B, nine; and Class C, thirty-one. In the latter all the cars employ four cylinders except one.

ENTRANT.	CAR.
CLASS A.—Petrol Vehicles having 1 Cylinder.	
De Dion Bouton, Ltd.	8-h.p. De Dion.
Anglo-American Motor Car Co., Ltd.	10-h.p. Cadillac.
Kennedy Motor Co., Ltd.	8-h.p. Darracq.
Wolseley Tool and Motor Car Co.	6-h.p. Light Wolseley.
CLASS B.—Petrol Vehicles having 2 Cylinders.	
Albion Motor Car Co., Ltd.	16-h.p. Albion.
Mo-Car Syndicate, Ltd.	12-h.p. Arrol-Johnston.
Argyll Motors, Ltd.	10-12-h.p. Argyll.
E. H. Lancaster	10-h.p. Clement.
J. W. Stocks	12-h.p. De Dion.
Central Motor Car Co., Ltd.	10-h.p. Ford.
Kennedy Motor Co., Ltd.	12-h.p. Darracq.
Wolseley Tool and Motor Car Co.	14-h.p. Wolseley.
Gladiator Co., Ltd.	10-12-h.p. Gladiator.
CLASS C.—Petrol Vehicles having 3 or more Cylinders.*	
T. C. Pullinger	16-20 h.p. Beeston-Humber.
Humber, Ltd.	8-10-h.p. Humber.
J. A. Peacock	18-h.p. Chenard-Walcker.
Rennie and Prosser, Ltd.	16-h.p. Gladiator.
Sunbeam Motor Car Co., Ltd.	12-h.p. Sunbeam.
T. Shaw, Dundee, Ltd.	18-h.p. Siddeley.
T. Shaw, Dundee, Ltd.	20-25-h.p. Ariel.
Mors, Ltd.	24-32-h.p. Mors.
Ernest H. Arnott	14-h.p. Minerva.
Swift Motor Co., Ltd.	12-h.p. Swift.
Argyll Motors, Ltd.	18-22-h.p. Argyll.
Argyll Motors, Ltd.	16-20-h.p. Argyll.
E. M. C. Instone	30-h.p. Daimler.
E. H. Lancaster	16-h.p. Clement.
Captain Masui	24-h.p. Germain.
John I. Thornycroft and Co., Ltd.	24-h.p. Thornycroft.
London Motor Garage Co., Ltd.	18-h.p. Pipe.
Mann and Overton's, Ltd.	16-20-h.p. Richard-Brasier.
J. L. M. Neilson	15 or 24-h.p. Ryknield.
Central Motor Car Co.	20-h.p. Ford.
D. M'Kay Drummond	20-24-h.p. Drummond.
Kennedy Motor Co., Ltd.	15-h.p. Darracq.
Belsize Motor Car and Eng. Co., Ltd.	30-40-h.p. Belsize.
J. W. Brooke and Co., Ltd.	15-20-h.p. Brooke.
Beaufort Motor Co.	24-30-h.p. Beaufort.
P. C. Kidner	7-9-h.p. Vauxhall f.
H. H. P. Deasy and Co., Ltd.	30-40-h.p. Martini.
Wilson and Dickson.	20-h.p. Renault.
Claud Hamilton, Ltd.	Undecided.
Argyll Motors, Ltd.	12-14-h.p. Argyll.
William M'Lean	14 or 20-h.p. St. Vincent.

* All have 4 cylinders except entry marked f.

British Motor Boat Club.—We are informed that on the occasion of the visit of the French fleet to Spithead, the Club proposes arranging an international motor boat race to take place between the lines of the British and French battleships. The opening meet of the Club is to take place at Kingston-on-Thames on Saturday, May 6th, to be followed by a dinner in the evening at the Sun Hotel, Kingston.

OUR readers will recall to mind that in our last number, Mons. Paul Meyan, of *La France Automobile*, issued a challenge to any all-British built car to engage in a reliability trial of 5,000 kilometres against his De Dietrich car. M. Meyan was prepared to back his challenge with 10,000 francs, and we are glad to be able now to announce that this sporting offer has been taken up by Mr. J. D. Siddeley, who proposes to enter against M. Meyan a Siddeley car, built by the Wolseley Company, and suggests that the trial should be organised and carried out by the Automobile Club of Great Britain and Ireland, and that instead of the whole distance being run in France, as proposed by M. Meyan, half of it should be covered in England, the distances run per day in the latter country being, in consequence, somewhat restricted. It is to be hoped that the arrangements for the competition will be carried through without a hitch, as it would doubtless prove of considerable interest to all British automobilists.

Hill Climb at Marseilles.—The results are announced of the hill test, organised by the Marseilles A.C., which took place on the 2nd inst. over 4 kiloms. on the Camp Hill. It was open only to members of the club, and the start was "standing." Classing for petrol cars was by cylinder capacity in six categories. The chief times in their order of classing were as follows, the best time of the meeting, 4 mins. 7 secs., being made by a Berliet car in Class 6:—

Motor Bicycles.—1. Buchet, 4 mins. 52 secs.; 2. Griffon, 5 mins. 57½ secs.

Cat. 1. Cyl. Capacity 1½ litres.—1. Richard-Brasier, 9 mins. 16½ secs.

Cat. 2. Cyl. 2½ litres.—1. De Dion Bouton, 7 mins. 1½ secs.; 2. De Dion Bouton, 7 mins. 19½ secs.; 3. Richard-Brasier, 7 mins. 30 secs.; 4. De Dion Bouton, 7 mins. 48 secs.

Cat. 3. Cyl. 3 litres.—1. Richard-Brasier, 5 mins. 50½ secs.; 2. Gladiator, 6 min. 30½ secs.; 3. Richard-Brasier, 7 mins. 6½ secs.

Cat. 4. Cyl. 4½ litres.—1. Berliet, 4 mins. 23½ secs.; 2. Rochet-Schneider, 4 mins. 45½ secs.; 3. Richard-Brasier, 4 mins. 52½ secs.; 4. Turcat-Méry, 5 mins. 28½ secs.; 5. Richard-Brasier, 5 mins. 30½ secs.; 6. Turcat-Méry, 5 mins. 40½ secs.; 7. Panhard-Levassor, 5 mins. 51½ secs.; 8. Rochet-Schneider, 6 mins. 23½ secs.; 9. Turcat-Méry, 6 mins. 50½ secs.

Cat. 5. Cyl. 6½ litres.—1. Turcat-Méry, 4 mins. 25½ secs.; 2. Turcat-Méry, 4 mins. 45½ secs.; 3. Turcat-Méry, 5 mins. 38 secs.; 4. Pilain, 5 mins. 41½ secs.; 5. Pilain, 6 mins. 34½ secs. 6. Pilain, 8 mins. 21½ secs.

Cat. 6. Cyl. over 6½ litres.—1. Berliet, 4 mins. 7 secs.; 2. Bayard-Clément, 4 mins. 15 secs.

Steam Cars.—1. Serpollet, 4 mins. 42½ secs.

Milan Tourist Trial.—Under the auspices of the Milan A.C. the important international contest for tourist cars has been definitely fixed to take place on May 15th, 16th, and 17th next, when over 40,000 francs in prizes, besides cups and trophies, will be offered. Irrespective of the honour of winning a high place in the trial, the event will afford a splendid opportunity for traversing some of the principal and most picturesque cities of Central Italy, whilst the trial itself will be preceded by festivities, under distinguished Italian patronage, which will include a gymkhana, corso fleuri, &c. There will be three categories, classed according to the price of the chassis, viz., Cat. 1. Chassis over 14,000 lire; Cat. 2. 5,001 to 14,000 lire; Cat. 3. Chassis (including carriage body) up to 5,000 lire. The latter category will have to cover 200 kiloms. per day, total 600. The first two categories have a choice of circuits, the selection of which will determine how they are ultimately classed for results. The first circuit is 1,500

kiloms. (500 per day), the second circuit 900 kiloms. (300 per day). Entrance fees vary from 100 to 250 lire, according to the circuits selected. The principal towns, with Milan as the start, which will be visited, are Rome, Modena, Florence, Bologna, Verona, Brescia, Padua, Ferrara, Ravenna, Vicenza, Parma, Perugia, &c.

THE Henry Edmunds Hill-Climbing Trophy is to be raced for on July 12th instead of July 13th as originally announced.

IT is now confirmed that, as stated by us recently, the famous Morris Park Trotting Track in New York is for the future to be given over to automobile racing.

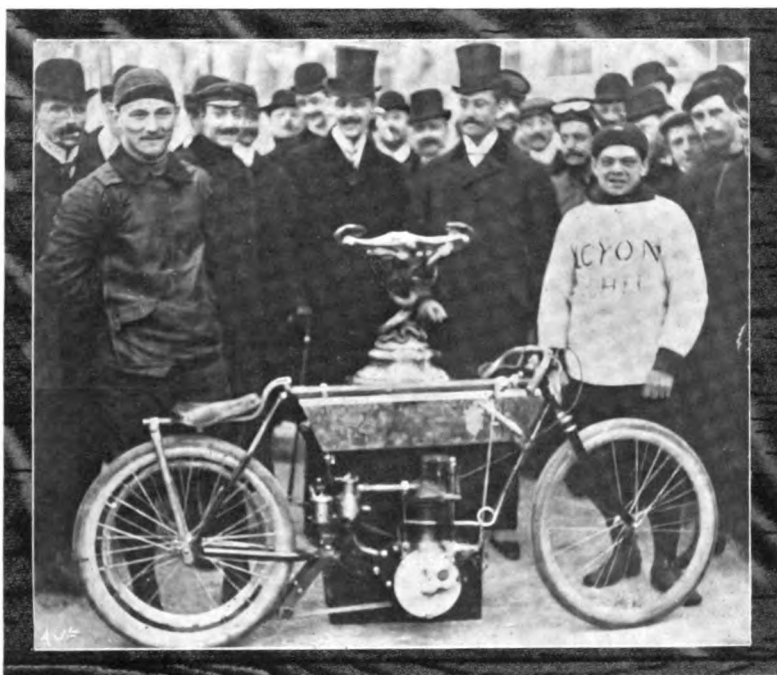
DISSATISFACTION is rife in America amongst the owners of French cars in consequence of the decision

of the A.C. de France to select as their representatives for the Vanderbilt Cup the first five cars entered for that cup in their order of arrival in the French Eliminating Trials for the Gordon-Bennett Race, on the Auvergne Circuit. A formal protest is to be made, as some of the prominent owners had looked forward to participating with their cars on behalf of France.

THE Long Island Automobile Club, it is reported, has decided on the construction of what will, as regards length, at any rate, be the record automobile racing track of the world. It is to be constructed on the great South Beach, from Fire Island to Montauk Point, and will be 80 miles in length. The track will run upon sand thoroughly well levelled, and as there will be no other traffic it is anticipated that it will be easily kept in good order. It is stated that the course will provide an absolutely straight stretch of 49 miles.

* * * * *

MOTOR CYCLING.



HYDRA CUP FOR MOTOR BICYCLES.—Anzani (on the left) and Perneti (on the right), the two first in the general classing for this Cup, which was offered for the speediest motor bicycle having a one-third litre cylinder capacity. Both rode Alcyon machines, one of which is shown in the photograph, together with the Hydra trophy in the background.

Hydra Cup for Motor Cycles.—Every record for the type of motor bicycle eligible to compete for this trophy, was lowered last week on the Paris Parc des Princes track, when 15 competitors came into line to contest the race, these being divided into two heats. Only machines with a cylinder capacity of one-third litre could take part. Anzani, on an Alcyon-Buchet machine, was an easy winner, over the prescribed distance of 100 kilometres, in 1 hr. 14 mins. 37½ secs., the second being Pernette, on a similar make of machine, in 1 hr. 18 mins. 45 secs. Bac, on a Magali machine, who was so successful last year, was unfortunate in breaking his foot-rest, which delayed him several minutes. Under the circumstances, his time of 1 hr. 25 mins. 15½ secs. was creditable. The general results were as follows:—

(1) Anzani (Alcyon-Buchet), 1 hr. 14 mins. 37½ secs.; (2) Bernette (Alcyon-Buchet), 1 hr. 18 mins. 45 secs.; (3) Champoiseau (Peugeot), 1 hr. 19 mins. 17½ secs.; (4) Giuppone (Peugeot), 1 hr. 19 mins. 31½ secs.; (5) Collomb (Magali), 1 hr. 22 mins. 19½ secs.; (6) Bac (Magali), 1 hr. 26 mins. 15½ secs.; (7) Robert S. (Lurquin-Coudert), 1 hr. 26 mins. 15½ secs.; (8) Pernette (Alcyon), 1 hr. 26 mins. 15½ secs.; (9) Cérés (Albatros), 1 hr. 26 mins. 41 secs.

Both the first and second machines were fitted with Dunlop tyres and Longuemare carburettors. Below we give a table showing the new records created, in stages of 10 kilometres, together with the speeds attained for each completed distance, and by fractions of 10 kilometres, adapted from figures published by *Les Sports*.

Auto Cycle Club.—An inter-club run to Bournemouth is officially announced for April 29th, the point for assembling being the Angel, Thames Ditton, returning on Sunday *via* Salisbury and Basingstoke.

Distance.	Rider and Machine.	Time			Average Speed.		Previous Records.	
		Elapsed.	Per 10 Kiloms.	Average per Kilom.	From Start.	Per 10 Kiloms.	Holder.	Time.
kils.		m. s.	m. s.	s.	kiloms.	kiloms.		m. s.
10	Giuppone (Peugeot) ...	6 54½	6 54½	41½	86·96	86·96	Georgis (Buchet) ...	7 40½
20	Giuppone (Peugeot) ...	13 52	6 58	41½	86·54	86·12	Georgis (Buchet) ...	15 8
30	Giuppone (Peugeot) ...	21 10	7 18	42½	84·90	81·42	Bac (Magali) ...	22 47
40	Thomas (Magali) ...	28 32½	7 9	42½	84·10	84·10	Bac (Magali) ...	30 25½
50	Anzani (Alcyon) ...	36 16½	7 38½	43½	82·50	78·56	Bac (Magali) ...	38 2½
60	Anzani (Alcyon) ...	44 40	8 23½	44½	80·72	71·90	Bac (Magali) ...	45 47½
70	Anzani (Alcyon) ...	52 6½	7 26½	44½	80·72	80·72	Bac (Magali) ...	53 33½
80	Anzani (Alcyon) ...	59 34½	7 28½	44½	80·72	80·36	Anzani (Alcyon) ...	61 39
90	Anzani (Alcyon) ...	67 7½	7 32½	45	80·00	79·64	Bac (Magali) ...	69 41½
100	Anzani (Alcyon) ...	74 37	7 29½	44½	80·50	80·36	Anzani (Alcyon) ...	77 37½

The ½-hour distance record falls to Thomas (Magali) with 42·04 kiloms., and the hour record is secured by Anzani (Alcyon) with 80·50 kiloms. (Previous record, Anzani and Bac, dead heat, with 77·9 kiloms.)

CLUBS AND ASSOCIATIONS.

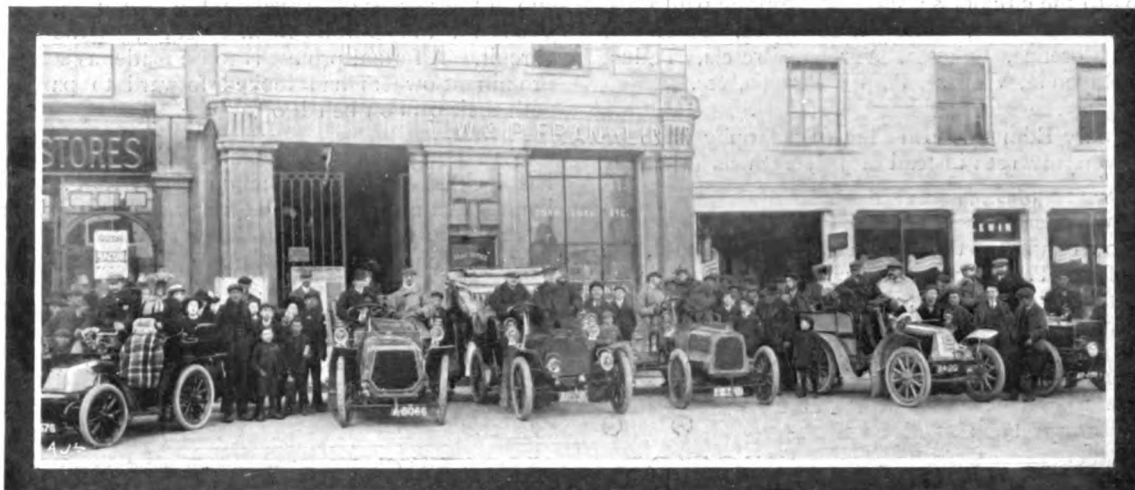


Photo by E. Kenealy.

OPENING RUN OF THE HERTFORDSHIRE A.C. ON APRIL 8.—Some of the cars in the Market Place, Hitchin.

Burnley A.C.—The annual general meeting of this club was held at the Bull Hotel, Burnley, on the 31st ult.

Present :—Messrs. C. Atkinson (chairman), J. Watts, J. Butterworth, S. H. Parkinson, J. Hurtley, T. W. Hargreaves, R. Riley (Nelson), H. Smith, T. G. Parkinson, W. Sutcliffe, J. Ridehalgh, and R. Cox.

The secretary's report specially referred to the part which the club had taken in opposing the application of the Todmorden Local Authority for a speed limit, which application was afterwards refused. He also announced that the committee were endeavouring to arrange runs to places of historical interest during the forthcoming season. The treasurer's report showed a balance in hand on the year's working.

Mr. S. Lawson and Mr. J. Butterworth were reappointed secretary and treasurer respectively, and the following gentlemen were elected members of the committee :—Messrs. S. Landless (chairman), C. Atkinson, J. Watts, H. Smith, T. G. Parkinson, J. Ridehalgh, J. Hurtley, and Dr. Doyle.

It was decided to contribute a sum of five guineas towards the special Legal Defence Fund formed by the Motor Union, and it was further determined to be affiliated to that body in future under scheme No. 2.

After the meeting, a paper was read to the members by Mr. A. J. McCormack, manager of the Gladiator Company, on "Motoring Topics," in which he dealt with the principle of carburation, more especially with automatic carburettors, afterwards touching on the relative merits of chain *versus* cardan drive. This instructive paper was accorded by the members present a hearty vote of thanks.

Bury and West Suffolk A.C.—The inaugural run of the season took place last week, when members of the Norwich and Eastern Counties A.C. joined with the club in a spin to Diss, starting from Bury St. Edmunds. Considering the earliness of the season, roads were found in good condition, about a dozen vehicles taking part in the outing. A number of ladies accompanied the members.

The Bury Club, which has now affiliated with the Motor Union, has very influential support in its work, with Earl Cadogan, K.G., as its president, the vice-presidents being Lord Iveagh, K.P., Sir Henry Bunbury, Bart., Sir T. G. Biddulph, Bart., the Hon. Walter E. Guinness, Messrs. Ernest Dresden, A. G. Goldschmidt, J. R. Hargreaves, and John Wood.

Herts A.C.—The opening run of the club took place on April 8th, many of the important towns of the county being visited in turn. The rendezvous was at St. Albans at 2.30. From there Hatfield was visited, the cars making a short stay at the Red Lion. Hertford was the next town visited, and the party proceeded to Hitchin *via* Stevenage. From Hitchin the cars proceeded to Luton and

Dunstable, and from there to Tring, Berkhamstead, and Watford. The roads were dry, and the meet was most enjoyable. The following were among the party :—Mr. and Mrs. Webster, 7-h.p. Mors; Mr. and Mrs. A. Hunt and Mr. C. Wood, 9-h.p. Renault; Mr. E. T. Pryor and Mr. W. S. Coles, 12-h.p. Crypto; Messrs. N. B., E., and A. C. Kenealy, 15-h.p. Darracq; Mr. G. Malton and Major Lloyd, 10-h.p. Panhard; Messrs. A. Hadden and G. Stevens, 8-h.p. Crypto; Mr. W. Whittall (hon. sec.) and Mr. W. Corse Glen, 10-h.p. Crypto; Mr. and Mrs. Bernard, 8-h.p. De Dion; Dr. W. P. Ker, 2½-h.p. Geake Bradbury.

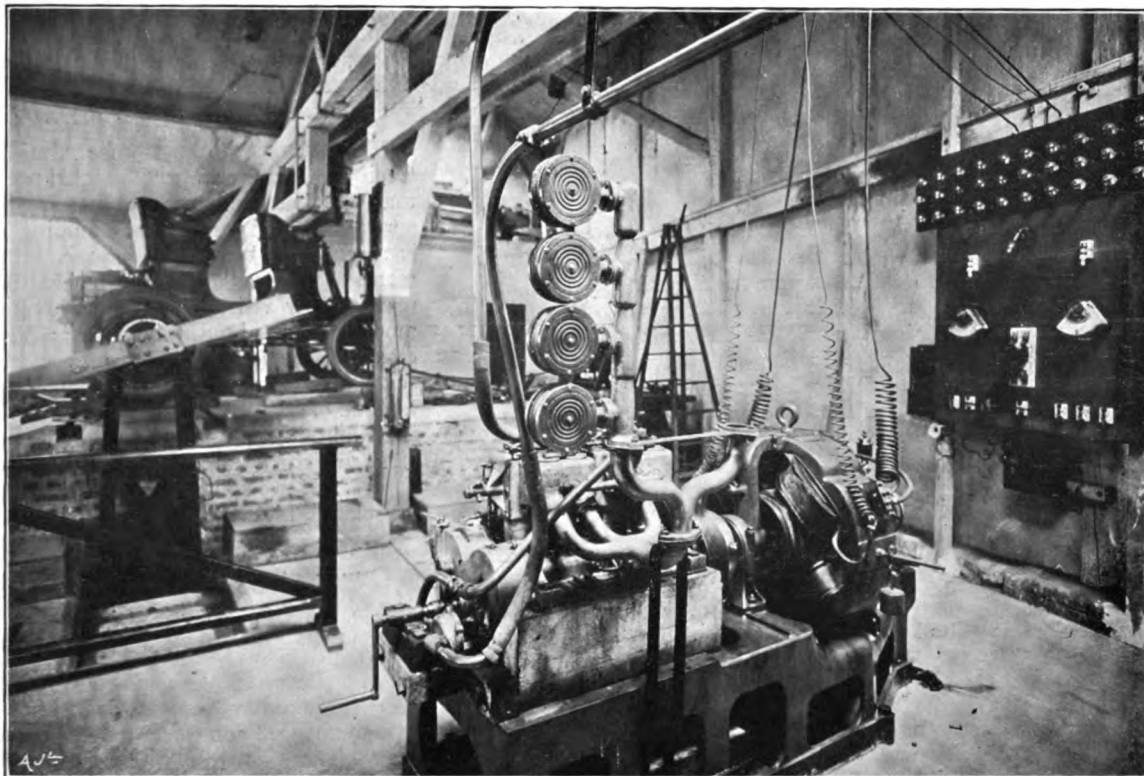
North-East Lancashire A.C.—The date selected for the hill-climbing contest, referred to in last week's issue, is May 18th.

Nottinghamshire A.C.—The opening run of the season took place on Saturday last, when this club joined the Derby, Leicester, and Wolverhampton clubs in a meet at Ashby-de-la-Zouch. Naturally, quite a large number of cars turned up, and by four o'clock in the afternoon there were about 100 motor vehicles of all descriptions assembled around the Royal Hotel. Amongst those who took cars were Messrs. Charles Hardy (president), Booth Granger (hon. secretary), M. Ross-Browne, W. Blamires, G. Kirk, G. Cowen, W. H. Appleby, A. R. Atkey, G. P. Houfton, H. Belcher, H. Bircumshaw, C. Evinson, E. H. Joule, C. Wilkinson, Metheringham, E. Fewkes, H. Bowden, E. H. Arnott, L. Thominet, F. Colman, S. Clifford, jun., Inston. Mrs. Shepherd was the only lady member of the club who took a car. Amongst others present were Messrs. Rees-Jefferies (secretary of the Motor Union), Carlos Levison (Royal A.C. of Madrid), G. E. Mawbey (president of the Leicester A.C.), McAlpin (hon. secretary), W. Hart (Mayor of Derby), C. J. Allen (secretary of the Derby A.C.).

Tea was served to about 180 guests, and many attended the dinner held later in the evening. Mr. Rees-Jefferies presided at a meeting of the members, held after the dinner, during the course of which Mr. Booth Granger informed those present that the membership of the Notts A.C. had increased 30 per cent. during the last four months, and that they now had 130 members.

Southern Motor Club.—The Glyn Arms Hotel, Ewell, *via* Tooting and Morden, is the venue for the opening run of the season to-day (Saturday). For to-morrow (Sunday) the Clayton Arms Hotel, Godstone, has been selected for the gathering point for luncheon at 1.30 p.m. The route will be *via* Croydon and Caterham.

A garage in connection with this club, for repairing and storing motors, has been inaugurated in the Bromfelde Road, Clapham, S.W.



THE A.C.F. SILENCER COMPETITION.—View of the testing plant in the Club Laboratory. The silencers are tested on a four-cylinder petrol engine which is coupled to a dynamo for the purpose of regulating the load. A branched exhaust pipe is fitted, and is provided with an arrangement by which either branch may be opened or closed as required. The silencer under test is coupled up to one branch, and the other may either communicate direct with the atmosphere, or, for the purposes of direct comparison, be coupled up to another silencer. The curious-looking silencing device seen in the photograph, is known as the "Aussud," and the exhaust gases escape from it through numerous small holes which are drilled in the ends of the four flat cylindrical boxes which branch out from the main exhaust pipe. Our photograph has additional interest; in that it shows—on the left—the fan-dynamometer, introduced by Col. Renard, and it will be noticed that there is a car in position, ready to be tested with this apparatus.

CORRESPONDENCE.

. *The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.*

CYLINDER LUBRICATION ON MODERN CARS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—In regard to your correspondent, Mr. Bayly, whose letter appears in your current issue on the above subject, I am quite in accord with his ideas on the subject, and have already an arrangement on my own 6-cylinder Napier, which exactly fulfils the ideal requirements mentioned by your correspondent. The arrangement is an oil plug, in each base-chamber, protruding upwards to the exact distance the depth of oil should lay. If a greater depth of oil is in the base-chamber, there is a small handle that communicates with the cocks in each base-chamber, and by pulling the handle forward, the cocks are opened and any surplus oil will run away. If not sufficient, fill base-chamber until oil runs through overflow cocks.

Yours truly,
S. F. EDGE.

Nice, April 9th.

PREVENTION BETTER THAN CURE.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—As you are no doubt aware, considerable annoyance has been caused on the Brighton road recently through motorists travelling at a speed in excess of the legal limit, with the result that the police have on this particular road found it necessary to organise traps, some of them with electrical timing apparatus, for the purpose of catching offenders and preventing fast driving on that

particular road. With a view of assisting the public to regulate the speed so as not to contravene the Motor Car Act, we have arranged for a special staff of cyclists bearing red flags to patrol the Brighton road and caution all those whom they consider are travelling at a speed which is illegal or dangerous. This will, no doubt, be very helpful to motorists using the Brighton road, as the cyclists who will be employed are skilled in judging speed, and will be able to indicate to any driver if his car is travelling at a speed which may cause the intervention of the police.

We hope that our efforts will remove any reason for complaint in a way which will cause no irritation to the public and will satisfy the police that it is unnecessary for them to continue the use of traps, and in order to ascertain whether our scheme is effective or not we shall be glad if the motorists on the Brighton road will inform the cyclists if they should come upon any specially arranged police traps.

The cyclists will start to patrol the road on Saturday, the 15th inst., and will continue on Sunday, the 16th, and also during the Easter holidays.

Yours truly,
CHARLES JARROTT AND LETTS, LTD.

April 10th.

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THE work of putting Madeira Road, Brighton, into thoroughly good condition for the motor race meeting, which commences on July 19th, is evidently not to be scamped. We recently announced that the Brighton Council had made a grant of £4,000 for the purpose, and now it has been decided to accept a tender of nearly £3,500 for carrying out the work, a tender of £1,000 less having been rejected.



One of the latest 28-32-h.p. Mercedes cars, fitted with a Rothchild Roi des Belges body, which was last week supplied by Cannstatt Mercedes, Limited, to Miss Ida Sharman Crawford, of Dublin. The car is arranged with every luxurious fitting to provide against all types of weather, dry or wet.

ON Monday last the motor car service to the Lizard, Mullion and Kynance Cove was commenced.

THE Duke and Duchess of Westminster have this week started from Paris for a motoring tour in France.

IT is not often that we encounter the sad case of an assaulted policeman complaining that the offence against him consisted of bombarding him with a £50 note. This, however, was the charge made against the driver of a motor car on a recent occasion, who was, of course, also charged with being drunk while in charge of an automobile.

WE have already chronicled the presence of several De Dion cars in the Transvaal; it is therefore of considerable interest to learn from Major Gordon Stewart, chief officer of the Johannesburg Fire Department, that a 6-h.p. De Dion car which he has had in use there for upwards of a year has proved of the greatest possible assistance to him in the discharge of his professional duties. Several times he has employed the car to run from Johannesburg to Pretoria and back again, a journey which it has accomplished in exceptionally good time, in spite of the fact that fully 90 per cent. of the distance is not really road at all, but simply a track across the veldt, and involves the crossing of several sluits and rivers. This is in itself an excellent testimonial of the qualities of the car, and an even better one is provided by Major Gordon Stewart's statement that when a fire occurs in his district his car invariably enables him to watch the last fire engine off the premises and to arrive at the scene of the conflagration before the first fire

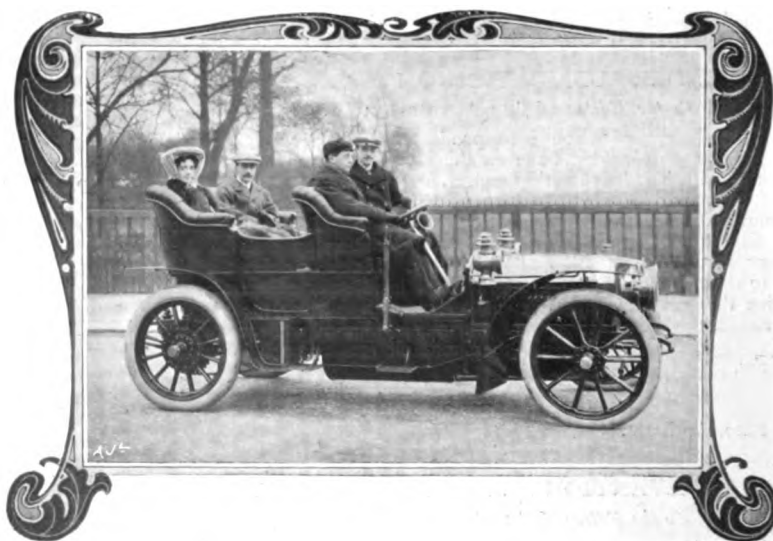
engine, which, as Major Gordon Stewart points out, "is saying a great deal," as the department possesses one of the finest studs of fire brigade horses in the world.

MOTORISTS who patronise the Hotel Cecil when in town will be glad to learn that the management has just opened a garage in that part of the building which is approached from the Victoria Embankment. The available space, which will be reserved for visitors' use, provides accommodation for about thirty cars. Visitors' cars will be garaged free of cost, but a scale of charges has been drawn up, to include cleaning and polishing, if this work is required to be done by the hotel garage staff, which is under the supervision of Mr. H. Hewetson, who for so long was associated in this country with Benz cars.

OUR contemporary, *The British South African Export Gazette*, provides some useful data in regard to the great and growing demand in the Colony for automobiles. Between £70,000 and £80,000 worth of motor vehicles were imported

during last year, some £28,000 worth being unshipped at Durban alone. There is every reason to conclude that the imports next year will be considerably greater, for it is stated by a local authority, well in touch with the movement, that—

"The motor boom has caught on in South Africa even more heartily than in the Old Country; and small wonder, too, for the motor car has infinitely superior opportunities for usefulness, and people on the other side are rapidly becoming aware of the fact. Of course, their requirements are not precisely similar to the English, and their warmer climate and inferior roads must be taken into account; but think of the vast distances to be covered, the extensive districts still lacking railway development, and the inadequate nature of the animal traction which has to serve so many purposes!"



Lord and Lady Newport are amongst the latest who have chosen a Crossley car for their personal use. In our photograph they are, with Lord Newport's brother, the Hon. H. Bridgman, the occupants of the Crossley touring carriage.

pump, such as that used for a bicycle tyre, is therefore provided, and there is a suitable valve-fitting in the top of the tank. Just one of those many little minor conveniences for saving time and worry, of which there are so many on the Clarkson car, is met with in conjunction with this hand-pump fitting, for the simple expedient of fitting the pump with a ball-shaped nipple, and of turning a corresponding spherical socket on the valve-fitting, enables the necessary air-tight connection between the two to be made instantly, and the same pressure that is exerted on the pump-plunger keeps the joint tight—although the pump is merely placed in position. The details of construction of the Clarkson automatic burner-regulator were given in our issue of December 26th, 1903, so that we do not propose to again repeat them in this article. The hand-control lever, E⁵, is seen in Fig. 3, on the dashboard, this forming a part of the same apparatus.

views in which all the more important parts are shown separately. Comparatively few important alterations have been made in the design since our article of November, 1902, so that the sectional drawings that we then gave are still to a large extent applicable. The chief changes are that piston-valves have been substituted for the flat valves, that all stuffing-boxes of the ordinary kind have been abolished, and that an extraordinarily high degree of perfection has been attained, in regard both to workmanship and material.

Our illustrations show that the two cylinders are quite independent of one another, that the steam-pipe connections, A¹, are in the cover-plates for the piston-valves, and that the exhaust passages run right through the castings in such a way that one exhaust-pipe connection, A³, is alone required for the two cylinders; between cylinder and cylinder is a short exhaust-pipe, A³. The inner cylinder-covers, A⁵, are

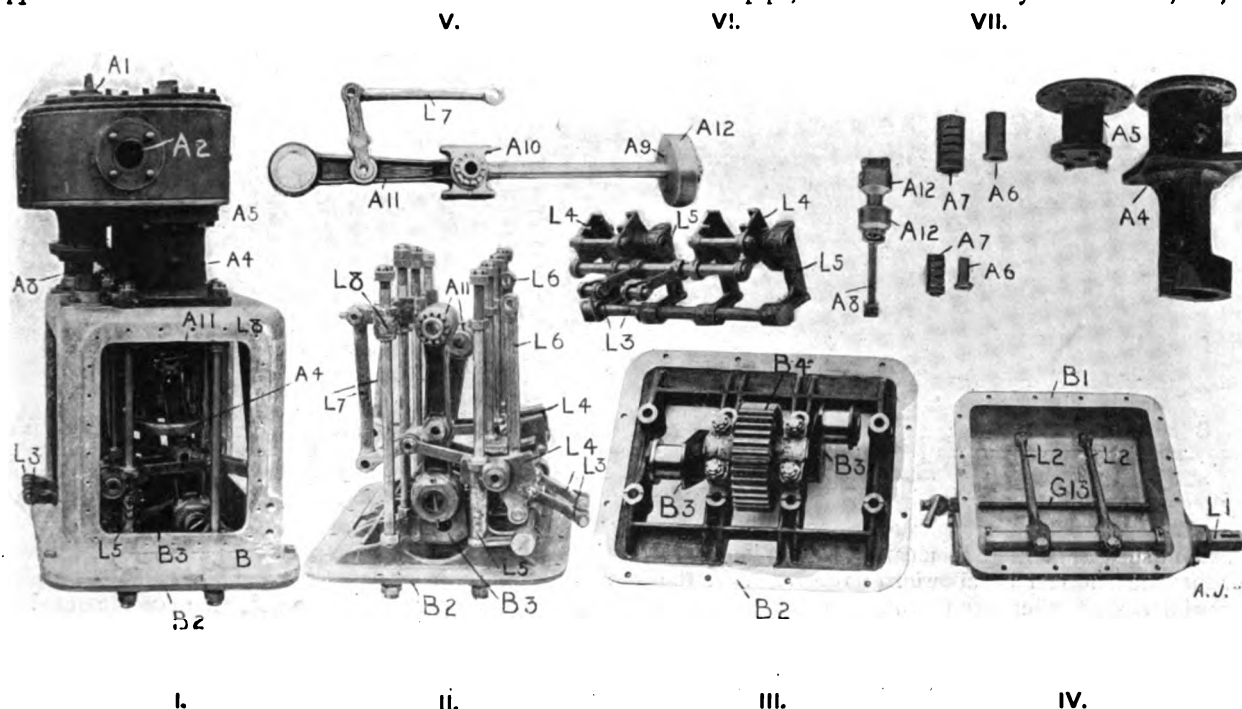


Fig. 6.—The Clarkson Steam Engine and some of its more important parts. (I) The complete engine, from the right side (shown vertically). (II) The bed-plate, B², with its steel pillars, crank-shaft, B³, connecting-rods, A¹¹, and valve-gear. (III) The bed-plate, B², with crank-shaft, B³, and spur-wheel, B⁴. (IV) The base casting, B¹, with oil valve-gear, G¹³, and reversing shaft, L¹. (V) One of the pistons, A³, with its cross-head, A¹⁰, connecting-rod, A¹¹, and a portion of the reversing-gear. (VI) One of the chief portions of the "Joy" valve-gear. (VII) A piston-valve, A³, an inner cylinder-cover, A⁵, and a crosshead-guide casting, A⁴, together with packing sleeves, A⁶, and springs, A⁷, for the piston- and piston-valve rods.

The water-feed on the chassis from which our photographs were taken, is controlled solely by the driver, but, in certain cases, it is more convenient for it to be regulated automatically. The device, which was also described in the previous article, above referred to, is then provided on the chassis. When regulated by the driver, there is a by-pass-valve in the delivery pipe that leads from the pump, D², to the check-valve, D³, on the boiler, and this by-pass is controlled by a pedal. For feeding the boiler when the engine is at rest, however, there is an auxiliary hand-pump, D³, fixed to the left of the driver, in conjunction with a shut-off valve, D⁴, for normally preventing any leakage back through the pump.

The Engine.

The complete engine is shown from the side, and from beneath, in Fig. 5, while in Fig. 6 are various

secured in place by the same bolts that fix the crosshead-guide castings, A⁴, to the cylinders, and these castings form an oil-tight casing between the cylinders and the crank-chamber, B.

The cylinder-covers, A⁵, are so constructed that they form a casing, inside which metallic packing-sleeves are free to float on the piston-rods in such a way as to prevent the steam from leaking past the rods. The rods of the piston-valves, A³, are also fitted in a similar manner, where they pass out from the cylinder-castings. In Fig. 6 (VII.), these parts, together with the sleeves, A⁶, are shown separately. The sleeves, A⁶, are bored out so that they are only about half-a-thousandth of an inch larger than the piston-rods on which they ride, and they are grooved out at intervals, internally, so as to trap any steam that may try to leak along the rods.

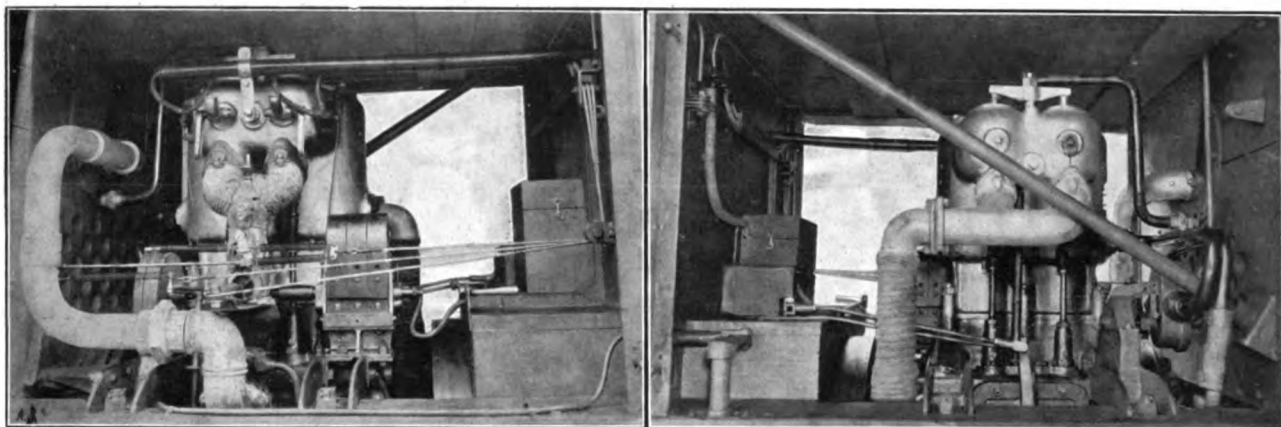
(To be continued.)

THE THORNYCROFT LURRIES, OMNIBUSES, AND VANS.—PART V.

STEERING is effected by a worm, at the lower end of the inclined steering-pillar, meshing with the toothed quadrant on the lower portion of the turntable. The steering is thus rendered irreversible, and the tractor is capable of turning round in a very small radius.

The back axle, which is driven by a single chain from the second-motion-shaft of the gear mechanism, has the drawbar hinged direct to its axle-boxes, in order to relieve the frame and the springs of the tractive strain, while, to prevent the drawbar from falling when not in use, a chain is connected between it and the back of the frame. The driving wheels are mounted on the ends of

low-tension igniters fitted into the walls of the inlet-valve-chambers. The cylinders have a bore of 6 ins., with a stroke of 8 ins., and the engine runs at a normal speed of 600 revs. per min. The two crank-pins are arranged opposite to one another, and the crank-chamber—which encloses all the moving parts in the usual way—has large detachable doors at the side. The engine is constructed to run either with petrol or with ordinary lamp oil, to suit individual requirements, the actual engine shown in Figs. 8 and 9 being equipped for running with the heavier fuel. The vaporiser for this purpose is visible in Fig. 8, where it will be noticed that it is connected by a



Figs. 8 and 9.—Views, from the left and from the right sides respectively, of the 30-h.p. kerosene engine on the Thornycroft Motor Tractor. In Fig. 8, the vaporiser, the magneto, and the low-tension igniters are visible, while in Fig. 9—which shows the exhaust-valve side—the circulating pump is seen.

the axle in such a way that they can either be locked to it, or that the axle can be allowed to revolve inside the hubs, while, as a further alternative, both wheels can be locked together (through the axle) so as to render the differential-gear inoperative. The winding-drum, that is fitted upon the axle, enables the cable to be run out either when the tractor is at rest or when it is moving, and provision is made for allowing the drum to slip to the required extent for paying out the cable, prior to winding it in again. In addition to the drawbar at the back, towing-links are also attached to each side of the main-frame in front.

The engine has its two vertical cylinders formed by a single casting, with interchangeable inlet and exhaust-valves operated from independent cam-shafts on each side, and with

short branched induction-pipe with the two cylinders, and that the exhaust gases are led through it by a pipe passing across from the other side of the engine. Initially, when starting up, the vaporiser is heated by a blow-lamp, but afterwards its temperature is maintained by the exhaust. A portion only of the air enters through

the vaporiser, the remainder being drawn into the induction-pipe through the atmospheric-valve seen in Fig. 8. The power of the engine is controlled by a throttle-valve in the induction-pipe, and the driver is also able to vary the strength of the spring that normally holds the auxiliary air-valve down on its seat. An automatic governor acts upon the throttle-valve, and there is hand-control for the fuel-feed.

The low-tension igniters are employed in conjunction with

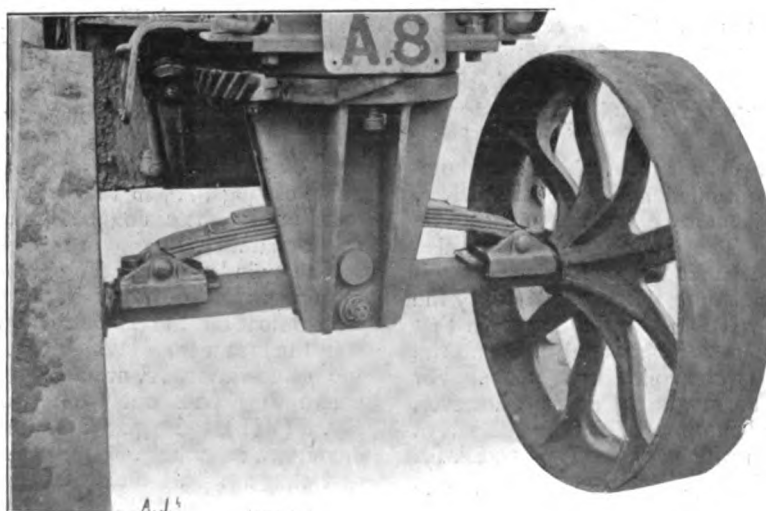


Fig. 7.—View showing the arrangement of the front axle on the Thornycroft Motor Tractor.

the magneto seen in our illustration, and this ignition system—which is not “timed”—is mainly used. There is provided, however, in addition, a high-tension system, with ordinary ignition plugs, with induction coils, and with a battery of accumulators, this latter system being “timed” in the usual way.

The cooling system is particularly interesting owing to the employment of a special form of cooler, which consists of planks over which the water is caused to flow by the circulating-pump. The water is thus made to offer a large cooling surface to the air that is drawn through the chamber containing the planks. The pump is mounted on the engine, as seen in Fig. 9, and there are two main supply tanks fixed beneath the frame—on either side of the engine; sufficient water is carried for running about 30 miles.

The fuel tank is placed beneath the driver's seat, though in some cases it is fixed in the “engine-room” instead, as, for instance, when the vehicle is, for special purposes, equipped with a dynamo to form a portable electric light plant; the dynamo then occupies the space beneath the seat. The fuel is fed to the vaporiser by gravity, the engine is lubricated on the “splash” principle, and the crank-chamber is fed with oil, occasionally, by a hand-pump placed in front of the driver.

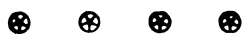
The flywheel lies immediately behind the engine, and has the main clutch combined with it, while the clutch-shaft projects right back to the rear of the frame, where it receives the starting handle at its extreme end. Mounted on this shaft, are two bevel wheels, which face one another, both meshing with a larger bevel wheel that lies between them. Either of the small bevel wheels can be

rendered rigid with their shaft, alternatively, by means of a two-way jaw-clutch, and thus a reversing gear is available, with a free intermediate position to enable the engine to be started. The larger bevel-wheel is fitted on the first-motion-shaft of the change-speed-gear, and there is a second-motion-shaft immediately beneath it, from which the power is taken by a single chain to the back axle. The three speeds are provided by sliding spur-wheels on the two shafts, these being operated by a hand-lever that is fixed to the right of the driver, and is provided with a quadrant having two alternative slots. The reversing lever is placed in the centre of the vehicle beside the driver.

A foot-operated brake acts on a brake-drum which is fitted on the clutch-shaft, and there is a very powerful screw-down brake fitted around the differential-gear on the axle. The main clutch is of the multiple-disc friction type which is used on all the Thornycroft petrol vehicles. In order to render the large engine easy to start, half-compression cams are mounted on the cam-shaft in such a way that they can be brought into operation at such times.

Very few self-propelled vehicles have been made, hitherto, to combine so many useful features as does this tractor, for apparently it is capable of performing everything for which ordinary traction engines and portable engines are employed, and yet it possesses the additional advantages of having a petrol engine. In agricultural districts, in particular, it should prove an invaluable acquisition.

(To be continued.)



THE GRIP OF THE OCTOPUS.

WHERE there happens to be a corporation which does not belong body and soul to the electric tram interest, that interest succeeds in throttling the expansion of that municipality's traffic with a grip which might excite the envy of Sinbad's Old Man of the Sea, or of the most wiry octopus that ever dragged down a swimmer in the Pacific Ocean. These reflections are suggested by the attempts of the Corporation of Croydon to supplement the electric tram system of the borough by a service of motor 'buses designed to connect up the outlying parts of the town with the tram and railway systems. The corporation had decided to devote a sum of £12,000 to the purchase of a dozen motor omnibuses, and thirteen roads had been mapped out on which the municipal motor 'buses were to ply for hire. The proposal was embodied in a Bill and submitted to Parliament, but the British Electric Traction Company (one of the principal tramway contractors of the country) and the South Metropolitan Tramways Company opposed it, with the result that the Committee of the House of Lords struck out the Croydon Corporation's proposal altogether.

Now this is a very serious business. Croydon is a town with well-populated outlying districts—we might almost call them suburbs. The electric tram system practically constitutes only one or two main arteries, running along the principal streets, where at several points it causes considerable congestion. The motor 'bus service was only intended to connect up outlying districts with the rather doubtful boon of the tramway service, and incidentally, of course, with the two railways by which Croydon is served. And yet we have

the electric tram interest successfully opposing such a project from the pure dog-in-the-manger spirit, and nothing else, for there is practically no probability that electric trams will be constructed over the routes which it was proposed should be served by motor omnibuses, or that it would be possible to find the enormous capital required to do so, even if the proposal were considered. In fact, the motor 'bus service would probably increase the receipts of the existing trams. But out of sheer hatred to the motor 'bus, and, we may undoubtedly add, fear as well, the tramway interests have opposed this measure, the successful passage of which would have been a boon and a benefit to the inhabitants of a large and scattered district. That Parliamentary committees should feel bound to take notice of such obviously interested opposition, dictated palpably by the most contemptible of motives, is one of those mysteries which it is rather difficult to fathom. But the attitude of the tramway interests in this question ought to serve as a warning to municipalities as to how they allow the tentacles of the tramway octopus to obtain a grip upon them.

It is our sad duty to chronicle the death of Mons. G. Forestier, a leading member of the French Automobile Club, and a prominent member of various technical departments under the French Government. Mons. Forestier was an enthusiastic automobilist, and has been one of the leading spirits in encouraging the movement from its very commencement. The deceased gentleman—a fine example of the cultivated scientific Frenchman—was professor in the Ecole des Ponts et Chaussées.

THE WOLSELEY INDUSTRIAL VEHICLES.

(Continued from p. 449.)

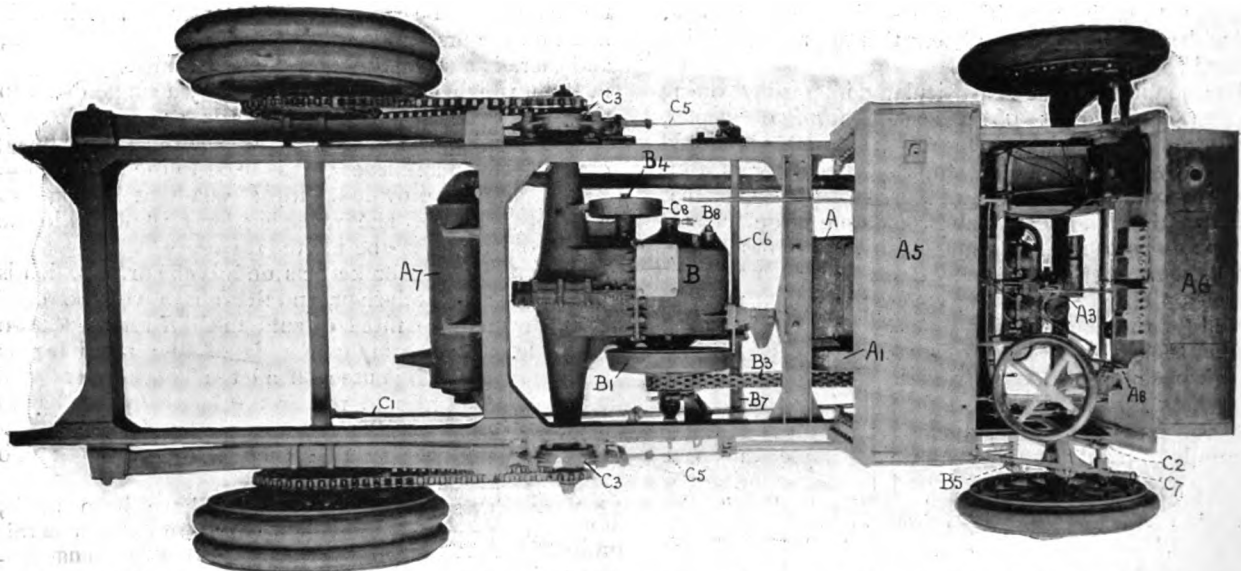


Fig. 2.—View of the Wolseley Omnibus Chassis, from above, with the combined water tank and radiator fixed in place above the 20-h.p. engine.

INDEX

OUTSIDE the gear-box, on the right-hand end of the first-motion-shaft, is fixed the main clutch, B¹, and, on the opposite side, the projecting end of the second-motion-shaft, B⁴, is provided with a brake-drum, C⁸.

The clutch, which is driven by the "Renold" "silent" chain, B³, is operated as usual by the pedal, B², and the brake that acts upon the drum, C⁸, is controlled by the pedal, C⁹ (as seen in Fig. 3). The sliding spur-wheels are, as usual, mounted on the first-motion-shaft, and are brought into mesh as required by a multiple-cam-drum on the shaft, B⁸, this shaft having a spur-wheel outside the gear-box, on the right, to enable it to be rotated by a toothed-quadrant. The quadrant and its sleeve ride freely

upon a rock-shaft, C⁶, which passes across from side to side of the frame and also passes through the gear-box casting; the sleeve is coupled up with the change-speed-lever, B⁵, by the rod, B⁶, which lies outside the frame.

Brake-drums are fixed to each end of the differential countershaft, just inside the sprocket-wheels from which the side chains are led to the driving wheels. These two brakes are simultaneously operated by one of the hand-levers beside the driver. The outer lever, C⁷, serves this purpose, it being connected—as seen—by an adjustable external rod, with the rock-shaft, C⁶, and the compensating cable, C⁵, being threaded through that rock-shaft. The construction of these countershaft

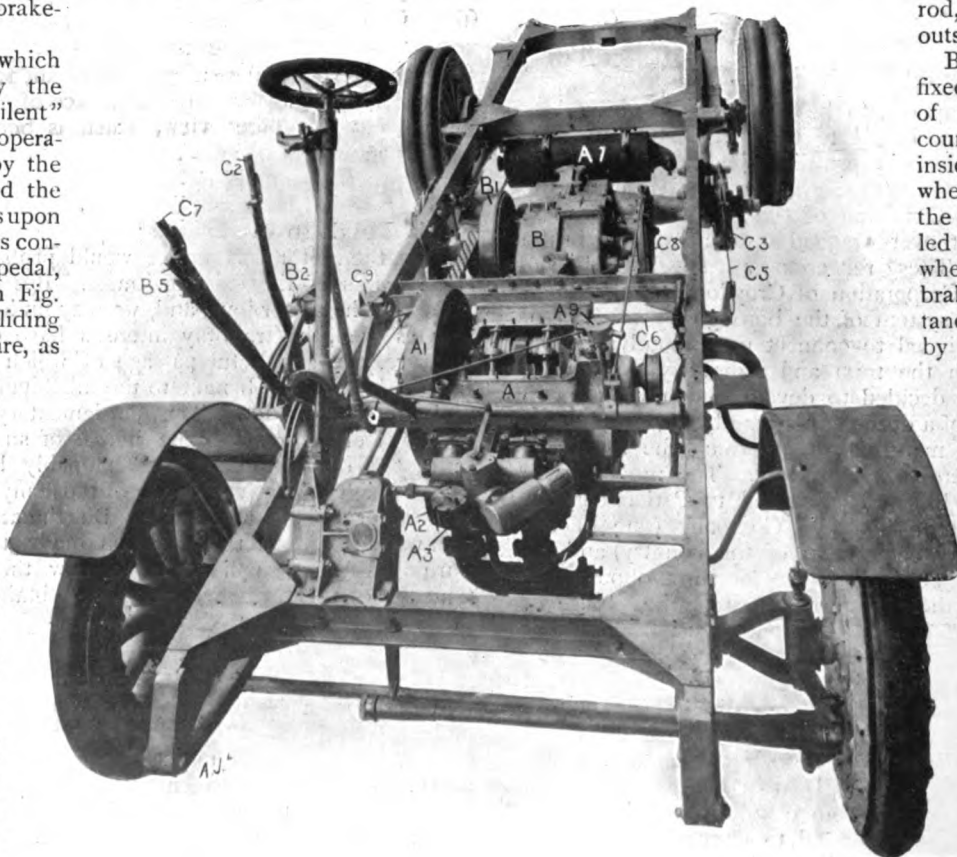


Fig. 3.—The Wolseley Omnibus Chassis, fitted with a 20-h.p. twin-cylinder engine. This particular chassis has a channel-steel frame, but those now being built have pressed-steel frames.

brakes is particularly well shown in Fig. 4, where it will be noticed that the two shoes, C^3 , are normally held clear of the brake-drum by a spring, but are simultaneously caused to tighten around the drum when the pivoted lever, C^4 , is moved about its fulcrum. Although the entire gearbox can, as usual, be moved bodily rearward for tightening the "silent" chain, B^3 , when necessary, yet it will be seen that the rock-shaft, C^4 , is compelled to travel with it, and that, therefore, the only adjustments needed to compensate for this operation are those provided by the running joints in the rods passing from the controlling levers and pedals. The brake-drum, C^8 , on the second-motion-shaft, B^4 , is so shaped that a certain amount of water can be retained inside it, and that it can, therefore, be kept cool, even if used for considerable periods at a time.

Another independent pair of brakes are also provided, these being of the internal expanding type, arranged so as

to act direct upon the hubs of the road wheels. These brakes, the construction of which is well shown in Fig. 5, are connected together, through a compensating device, by a rock-shaft, which passes across beneath the back axle, so that both are simultaneously operated when the jointed rod, C^1 , is drawn forward by the inner handle-lever, C^2 . The two brake-shoes, C , are pivoted to the same pin at their rear ends, and are connected together in front by an adjustable link, which forces the lower one down at the same time—and with the same degree of pressure—that the other one is forced upwards; the arrangement of the parts is clearly seen in our illustration. By the arrangement adopted, both shoes are held clear of the drum when not in use, and the brake—like those on the differential countershaft—acts equally well in either direction.

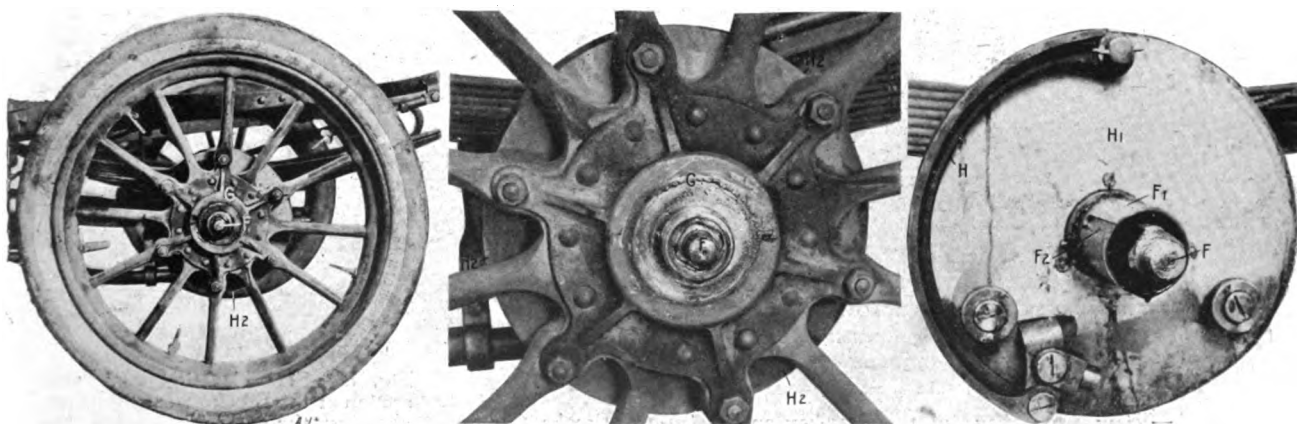
(To be continued.)

LIVE-AXLE DRIVE.

ONE of the most important considerations in the construction of live-axle cars is the method to be adopted for supporting that part of the load which comes on the driving wheels. If the driving wheels are keyed directly to the axle, there is a tendency for the weight to "splay" the wheels, because the live-axle is divided at its centre on account of the differential gear. In order to eliminate this tendency by removing the stress, some makers have adopted the practice of mounting the wheels on tubular extensions of the axle-casing, and the manner in which this is done in the case of the Hotchkiss cars, is clearly indicated in our photographs. The view on the left shows a driving-wheel in place on a chassis, and the hub-cap has been removed to expose the end of the live-axle, F . The centre illustration is a closer view of the centre part of the wheel, and shows the squared end of the live-axle,

F , which drives the wheel through the hub-plate, G . The wheel has been removed from the right-hand illustration which shows the extension of the axle-casing, F^1 on which the wheel revolves, and the projecting end of the live-axle, F , which merely drives the wheel by means of the square coupling shown in the centre view. The axle-casing, therefore, carries all the load, and the live-axle is, in consequence, merely subjected to torque. The axle-casing, F^1 , is cut with a keyway, F^2 , for the purpose of holding the ball race.

One of the shoes of the internal expanding brake is visible in the right-hand view, the companion shoe having been removed. The brake-shoes are carried by a plate, H^1 , which rides on the axle-casing, but is anchored to the frame, and they act on the inner face of a drum, H^2 , prominent in the other view, which is bolted to the road-wheels.



Views of the Hotchkiss Live-Axle Drive, showing, on the right, the tubular extension of the axle casing on which the wheel revolves, and the projecting end of the live-axle which drives the wheel, but carries no part of the weight of the vehicle.

To meet with a description of an agricultural motor in Greek, even though it be modern Greek, comes as something of a shock. But the recent developments in this direction have been duly chronicled by our contemporary the Ο'Αγγλοανατολικός ΑΓΓΕΛΙΑΦΟΡΟΣ ΤΟΥ ΛΟΝΔΙΝΟΥ, published in London. Αυτοκινητον (auto-

kineton) appears therefrom to be the modern Greek equivalent for automobile, and a very good name it is. One of the illustrations given shows το γεωργικόν αυτοκινητον σειρον διπλων αροτρων (which we conclude means "an agricultural motor ploughing a double furrow"). The expression is almost reminiscent of Hesiod.

THE NEW 35-H.P. BROOKE CAR.

(Concluded from p. 447.)

It will be noticed, in Fig. 9, that the lever-arm, N^3 , is provided with a counter-weight, N^3 , because otherwise the centrifugal force exerted upon it, when the clutch revolves at high speed, would tend to throw it outwards, and to prevent the clutch from being disengaged. The clutch is operated by the usual form of pedal, through a fork which engages in the groove, M^3 , immediately behind the cone, M^3 , and there is a ball-bearing, M^6 , to take the thrust of the clutch-fork. The internal spring, P^3 , needs no adjustment, for it merely has to overcome any tendency that there may be for the clutch-ring, P , to expand of its own accord, but the external spring, M^4 , which regulates the fierceness or the softness of engagement, has a couple of lock nuts behind it by which its strength can be varied. The sliding cone, M^3 , is mounted on feather-keys on the shaft, M , and it therefore revolves with the casting, N ; the only relative motion that there is between it and the lever, N^3 , is allowed for by the roller, N^4 .

Clutches of this kind have been manufactured by Messrs. Brooke and Co., for other purposes, for a considerable period of time, and have been found extremely satisfactory and durable. For automobile work, comparatively little modification has been found necessary, and apparently the type which we have just described is admirably suited both for motor cars and for motor boats.

bearings for all three shafts are formed between the two main castings, and the base portion is fixed to the two cross members of the frame.

The spur-wheel, Q , which is solid with the "driving" shaft, Q^1 —and, therefore, with the clutch-shaft, M —is at all times in mesh with the larger wheel, R , on the lay-shaft, but it is sufficiently wide to allow the sliding-wheel, S^2 —which has internal as well as external teeth—to fit over it, with the object of giving a direct-through-drive to the shaft, S , on the "third" speed. The wheel, S^2 , forms one of the two sliding members, the wheel, S^1 , on the same shaft constituting the other sliding member. The wheel, S^2 , is shown in its "second" speed position, for it meshes with the wheel, R^2 , on the lay-shaft, but it normally lies midway between the wheels, R^2 and Q . The other sliding-wheel, S^1 , can either be brought into mesh with the wheel, R^1 , to give the "first" speed, or with an intermediate

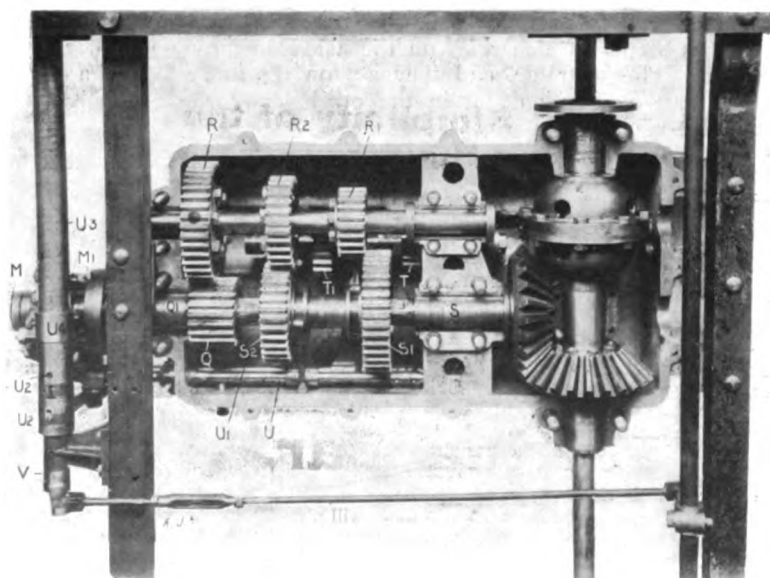


Fig. 11.—View, from above, of the Gear-box on the 35-h.p. Brooke Car. In this illustration, the upper half of the gear-box has been removed to show the interior mechanism.

The Change Speed Gear.

The arrangement of the gear-wheels in the gear-box is very clearly shown in Fig. 11, this being a view from above, which corresponds with Fig. 1. The upper half of the box has been completely taken off, as it can be, without disturbing any of the mechanism, but it should be mentioned that there is a very large lid in the upper portion, so that the gear-wheels can in practice be examined without detaching the whole casting. The

pinion, T (which lies beneath), to give the "reverse," but at the same time that it is moved into mesh with the wheel, T , another spur-wheel, T^1 , on the same intermediate shaft, is brought into gear with the wheel, R^1 . The arrangement adopted involves the employment of a control mechanism very similar to that used on the well-known Mercedes cars, but since only three, instead of four, forward speeds are necessary, only two sliding-rods (U and U^1) are needed for giving all the

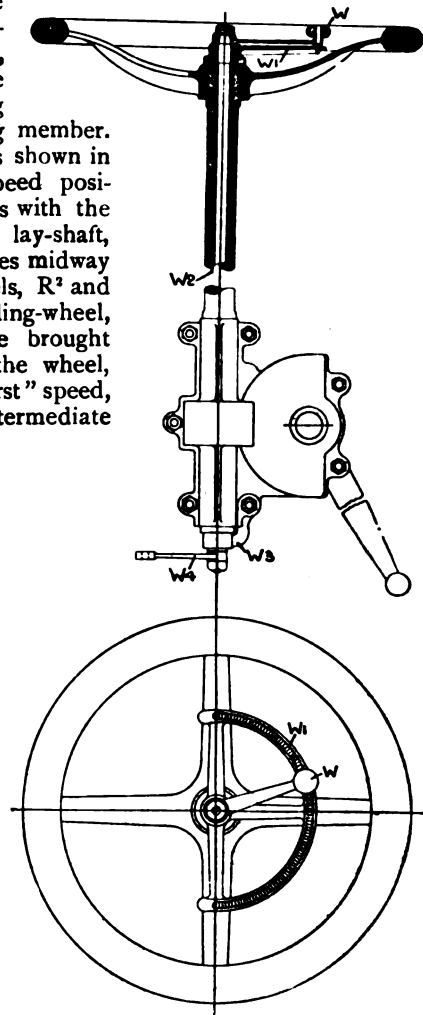
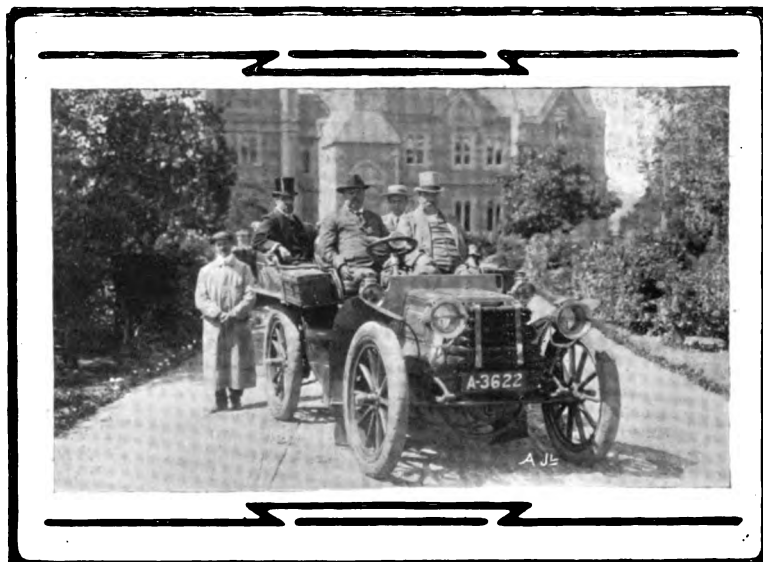


Fig. 12.—Side elevation and part section of the Brooke Steering Pillar, showing the arrangement of the hand-lever above the wheel, and of its stationary quadrant.

AN old Indian chief of Minnesota, well-known on the other side of the Atlantic, has fallen a victim in his old age to the automobile mania. His grandson is apparently a reckless sportsman of much the same calibre as himself, and the old gentleman, who owns a racing motor car, recently wagered him that he would give him a flying start and beat him within 100 yards. Whether the spirit of battle became too much for the Indian brave is not known, but after the horse started he drove straight at him, smashing up the animal, which was instantly killed, while injuries were inflicted on the old Indian himself to which, unhappily, he has succumbed.

A GOOD deal of nonsense has been talked in reference to the Long Acre fire, and the extent to which stores of petrol on the premises must have contributed to "feed the fury of the flames." How little truth there can be in this contention is well illustrated by the disinterment of the Ariel Motor Company's supply of petrol, which is required by Statute to be stored in separate 2-gallon tins in a proper petrol pit. After the fire was over, hundreds of tons of *débris* were removed from over the pit, so as to enable experts to see what condition it was in. When opened in the presence of Col. Fox, chief of the Salvage Corps; Mr. Gamble, of the Metropolitan Fire Brigade; the chief inspector of the L.C.C. Explosive Department; and Mr. Harvey du Cros, jun., the pit was found full of water, but not one of the cans was injured in any way, so that it was quite impossible that they could have increased the fire. We reproduce photographs showing the disinterment of the petrol pit, which forms a striking object-lesson of the perfect safety of storing petrol under proper conditions.

MR. CLAUDE JOHNSON, owing to pressure upon his time, has resigned from the Committee of the A.C.G.B.I. Mr. Sidney Straker has been elected to fill the vacancy.—Another resignation is that of Mr. Edgar Jepson, the editor of the Club Journal.



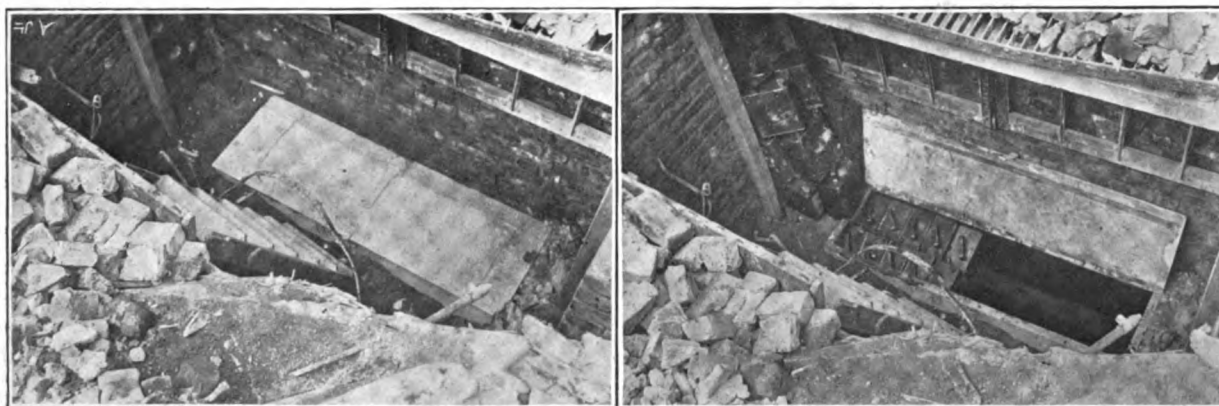
"Encircling the World" Week by Week.—An incident in the tour of Mr. Glidden round the world. When in Tasmania, Mr. Glidden took as guests on his car the Rt. Hon. Sir G. H. Read, the Prime Minister of the Commonwealth of Australia (who is seated to the right of Mr. Glidden, at the wheel), and the Hon. J. W. Evans, Premier of the State of Tasmania, who occupies a seat in the tonneau by the side of Capt. Darmer.

COMMERCIAL POINTS.

THE Marquis of Waterford, Lord Hastings, Lord Northbourne, and the Hon. Rupert Guinness are among those who have recently acquired Gladiator cars of the 1905 type.

THE CONTINENTAL TYRE COMPANY have recently compiled a very handy little table of suitable sizes of tyres for motor cars. The table is based on maximum speed and weight, and shows at a glance the size a tyre ought to be if the motorist would get the most out of his tyres for the money.

IN connection with Miss Dorothy Levitt's record run from London to Liverpool and back on an 8-h.p. De Dion, which we recorded last week, Messrs. De Dion Bouton, Limited, the manufacturers of this car, rightly think it is worthy of special note that Miss Levitt was not accompanied by a mechanic.



The Safety Petrol Pit of the Ariel Motor Company, Limited, at their late premises at 132, Long Acre, which a short time ago were completely burnt out. After the whole of the *débris* was removed, the tank and the cans of petrol were found completely intact. In the photograph to the left, the pit is shown before the tank was opened, and to the right the 2-gallon cans of petrol are seen intact.

LORD SUFFOLK has recently secured one of the latest type of the M.M.C. cars.

A SUPPLEMENT to their 1905 Catalogue has just been issued by the United Motor Industries, and contains particulars of several useful accessories, notably the Castle commutator (model R), and the "fault finder," which is a simple little device for testing coils.



DOINGS OF PUBLIC COMPANIES.

NEW ISSUE.

A. Vedrine and Co. (Limited).—The prospectus of this company has been issued this week to take over the well-known motor vehicle body building business of Messrs. Vedrine and Co., of Paris, which has been conducted so successfully in France. From the figures published in the prospectus, the business appears to be an extremely progressive one, the profits having more than doubled in 1904 over those of 1903. With the additional working capital which the present issue will provide, it is estimated the profits will be further enormously increased. In addition, with the backing which the business will have with such well-known and influential business men on the Board as Mr. Darracq, the managing director of A. Darracq and Company, Limited; Mr. Charles Jarrott, of Charles Jarrott and Letts, Limited; Mr. Ulcoc, of Chalmers, Guthrie and Company, Limited; Mr. Bloch, of William Whiteleys; and Mr. D. Vedrine himself, who has made a strong mark in the carriage world, the future of the company should be well assured. A satisfactory feature of the transfer of the business is that the vendors take practically their main interest in the purchase price, in shares. The capital of the company is £130,000, of which £65,000 in £1 is now issued.



BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, 232, Strand, W.C.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

27748. 19th December, 1904. Improvements in means for Controlling the Supply of Fuel to the Cylinders of Internal Combustion Motors. The Société Nouvelle des Etablissements Decauville Aîné, Petit Bourg, France. Date under International Convention, 23rd September, 1904. The object of this invention is to effect the control without in any way altering the arrangement of the gear which controls the supply-valve, the latter being operated by a cam to the same extent during each cycle. For this purpose an auxiliary slide-valve is provided. The slide-valve is fitted to the spindle of the inlet-valve, upon which spindle it is constructed to slide, so that the passage for the inlet of the fuel can be

the movement of the lever, *j*, will, by means of the slide-valve, in accordance with its position, relatively to the seating of the valve, *c*, throttle the inlet of the charge to the desired degree. A spring, *k*, is fitted to the spindle to assist its upward movement, and to keep the abutment in close contact with the lever, *k*. April 6th, 1905.

7782. 2nd April, 1904. Improvements in or relating to Internal Combustion Engines. Andrew Jack, Canema, Langbank, Renfrewshire. The invention comprises many improvements in connection with internal combustion engines, but the chief of them, as shown in Figs. 1 and 2, is for the purpose of adjusting and controlling the time of ignition to such an extent that the engine may be reversed, principally in engines of the two-stroke or one-revolution cycle. There are twenty-three figures. A contact maker and breaker is used, consisting of a rotor part driven by the engine, and a stator part

A is again in communication with E. Then ignition will occur again when F comes in contact with A, that is, when the crank and piston are about half in on the in stroke, resulting in reversal of the engine. Continuing the motion of H, after reversing, will increase speed until G limits the advancement of ignition at the greatest degree desirable. April 6th, 1905.

Patent Specifications Published.

*Applied for in 1904.
Published April 6th, 1905.*

- 6,901. W. BAXTER AND E. C. CALEY. Change speed mechanism.
- 7,782. A. JACK. Internal combustion engines.
- 10,221. G. PILKINGTON. Engines, change-gear, and clutches.
- 14,370. ALBANY MFG. CO., LTD., AND F. LAMPOUGH. Exhaust silencer and dust and odour preventer.
- 16,541. F. GOODWIN. Lamps.
- 27,748. SOC. DECAUVILLE AÎNÉ. Controlling supply of fuel.
- 29,408. L. RENAULT. Electric ignition.
- 29,409. L. RENAULT. Carburetors.

Published April 13th, 1905.

- 6,951. L. B. DE LAITTE. Carburetors.
- 8,410. A. AND R. SMITT. Change-speed-gear.
- 9,838. E. T. POLLARD. Explosion engines.
- 9,973. E. M. PRESTON AND E. F. SIMMONS. Variable speed-gear.
- 10,661. A. B. CAREY. Gearing.
- 11,054. R. M. KITTO. Brake handles.
- 11,348. D. ROBERTS AND C. JAMES. Governing.
- 11,388. A. R. BELLAMY. Gas and explosive vapour motors.
- 11,545. G. E. GAIFFE. Induction coils.
- 13,335. G. WADHAMS AND H. YOXALL. Lubricating driving chains.
- 15,183. H. LUCAS. Lamps.
- 19,947. H. GARNER. Tyres.
- 20,591. C. F. PARMENTER. Carburetors.
- 24,469. H. BÉSSING. Driving-mechanism.
- 27,794. J. S. CUNDALL and others. Explosion engines.
- 29,060. L. RENAULT. Valve gear.

Applied for in 1905.

Published March 30th, 1905.

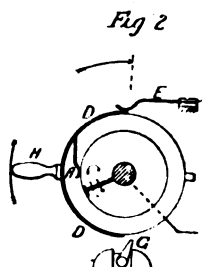
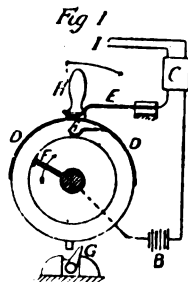
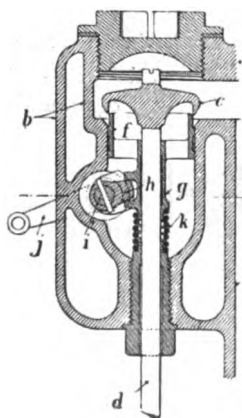
- 2,557. G. H. OLLIVER. Axles and gear.

Published April 6th, 1905.

- 1,754. H. DE LA VALETTE. Electric ignition.

Published April 13th, 1905.

- 3,908. T. J. CROKER. Explosion engines.



throttled by means of the auxiliary-valve. There are two figures. Fig. 1 is a sectional elevation in a central plan. Fitted in the valve-box, *b*, which is attached to the motor cylinder wall, *a*, is the inlet-valve, *c*, having the usual spindle, *d*. The spindle, *d*, is operated by means of the usual cam, and its stroke does not vary. The supply of charge to the cylinder is regulated by means of the slide-valve, *f*, which throttles to any desired extent between full admission and complete cut off. On the sleeve, *g*, of the slide-valve is a fork or double abutment, within which fits the shorter arm, *h*, of a lever, the fulcrum spindle, *i*, of which projects through the valve-box. A lever, *j*, is fixed to the spindle, *i*, on the outside of the box, and the end of it is connected to a controlling device on the steering-wheel. It will be seen that

adjustable in position for ignition timing. A is the normally stationary primary contact, a member of the stator part. B is the battery. C is the adjusting coil of primary and secondary winding, with the usual condenser and trembler. D is a conductor which continues the circuit to A. E is a fixed conductor which continues circuit to A and D. F is the contact revolving with the crank-shaft. G is a stop, which only permits the controlling handle, H, to travel about one revolution, carrying with it A and D. I is the spark gap in the secondary circuit. If, as shown in Fig. 1, F is in contact with the position of A, and the crank and F revolve as indicated, ignition time would be at or near inner dead centre. If the handle, H, carrying A, is turned as indicated by the arrow, ignition time becomes later, and, proceeding further, A in the lower part of its sweep has electric communication with E cut off, until on reaching the position of A in Figure 2,

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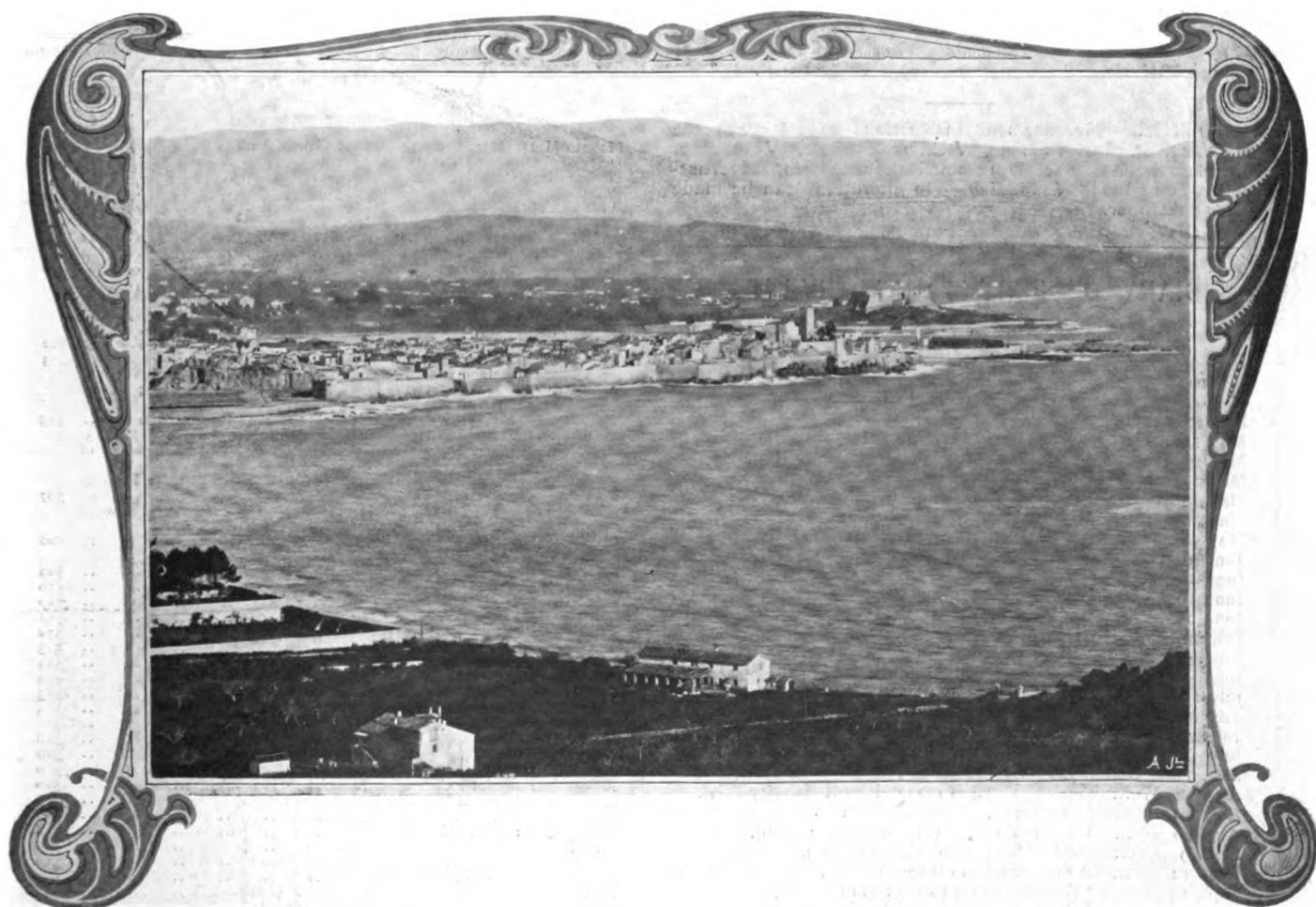
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MONACO MOTOR BOAT MEETING.—A general view of Antibes taken from the Phare de la Garoupe. Antibes was one of the extreme points of the course which had to be covered by the Cruiser Section in the Motor Boat Races

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NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C., by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
May 6...	Auto Cycle Club Hill Climb.
May 10-13 ...	Scottish A.C. Reliability Trials.
May 12 or 19...	*Quarterly 100 Miles Trials.
May 13 ...	Auto Cycle Club Members' Penalty Run.
May 20 ...	Motor Union Inter-Club Meet (Welbeck).
May 20 ...	200 Miles Trial (Motor Cycling Club).
May 30 ...	*Gordon-Bennett British Eliminating Trials.
May 30 ...	Auto Cycle Trials and "Selection" Race.
June 3 ...	Bexhill Race Meeting.
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.).
June 10 ...	London-Edinburgh (Motor Cycling Club).
June 24 ...	100 Miles Passenger Trial (Motor Cycling Club).
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 4-5 ...	*Motor Boat Trials (Southampton).
July 8...	Auto Cycle Club Consumption Trial.
July 12 ...	*Hill-Climb (Henry Edmunds Trophy).
July 19-22 ...	*Brighton Speed Races.
July 27-28-29 ...	*Blackpool Motor Meeting.
July ...	24 Hours Run (Motor Cycling Club).
Aug. 11 or 18 ...	*Quarterly 100 Miles Trials.
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 19 ...	*Van Trials, Light and Heavy Vehicles.
Aug. 26 ...	Inter-Team Trial (Motor Cycling Club).
Sept. 9 ...	Brown Cup (Motor Cycling Club).
Sept. 12 ...	Auto Cycle Club Race Meeting.
Sept. 14 ...	*Tourist Trophy (Isle of Man).
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).
Sept. 18-Oct. 3 ...	*Reliability Trials.
Oct. 4 ...	*Speed Trials.

* Automobile Club of Great Britain and Ireland Events and Papers.

Nov. 10 or 17 ... *Quarterly 100 Miles Trials.
Nov. 17-25 ... Society of Motor Manufacturers and Traders Exhibition at Olympia.

Foreign Events (Trials, Races, &c.).

1905.	
May 11-25 ...	Stockholm Automobile Exhibition.
May 13-21 ...	Auto Cycle Club de France Tour.
May 15-17 ...	Italian Tourist Trial (A.C. Milan).
June 16 ...	French Selection Race for G.B.
June 18 ...	International Motor Cycle Cup.
June 20-28 ...	Aix-les-Bains Week.
July 5 ...	Gordon-Bennett Race.
July 9-22 ...	Ostende Automobile Meeting.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Calais-Ramsgate (Motor Boats).
July 16 ...	Mont Cenis Hill Climb.
July 20-26 ...	Paris-Trouville (Motor Boats).
July 28 ...	Gaston Menier Cup (Motor Boats).
July 28-Aug. 8 ...	Paris Industrial Vehicles Trials (A.C. France).
Aug. 6-7 ...	Circuit des Ardennes.
Aug. 10-16 ...	Herkomer and Bleichroder Races.
Aug. 11 ...	Anthony Drexel Cup (Motor Boats).
Aug. 12 ...	International Cup for Motor Boats.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Vincenzo-Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.
Sept. ...	Tourist Car Trial (A.C. de France).
Sept. 3-10 ...	Royan Meeting.
Sept. 3-10 ...	Spa Automobile Club.
Sept. 11 ...	British International Cup (Motor Boats Arcachon).
Sept. 12-14 ...	Lake Lucerne Motor Boat Meeting.
Oct. 1 ...	Chateau Thierry Hill Climb.
Oct. 15 ...	Gaillon Hill Climb.

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PASSING EVENTS.

Club Driving Certificates.

WE mentioned, some weeks ago, that the Automobile Club had determined to undertake the examination of drivers, and to issue certificates to such of them as might successfully go through the examination. The full rules have now been drawn up on this important matter, and the conditions laid down under which the certificates will be granted. As already stated by us on March 11th, there will be two classes of certificates, owners' certificates and paid drivers' certificates, the former being granted in perpetuity, or until forfeited by some such act as inconsiderate driving, or upon the owner becoming a paid driver, and the second renewable from year to year. In both cases these only relate to the particular type or types of cars in which the drivers have been examined. It is in organising a system of providing reliable certificates for paid drivers that the principal usefulness of this idea would appear to consist. If carefully and conscientiously carried out, as there is every reason to believe it will be, car owners will be provided with a means of making sure that any driver they may engage possesses a reasonable degree of competence, that he is not a reckless or inconsiderate driver as far as can be ascertained, and that there is nothing known against his general good character. It is perhaps unnecessary to advise owners in general to make a rule from now on of engaging no motor car driver as a servant who does not possess the club certificate. In this way the list of certificates will constitute a valuable registry of motor car drivers, and should quite get over the difficulties involved in the scheme adopted some considerable time ago, and dealt with rather critically by this Journal, of keeping a register of motor car drivers at the club. At the same time, this action on the part of the club, if properly supported in this way by members of the club and automobilists generally, should practically do away with the evils of the bogus driving establishments to which we referred on the 8th of the present month. In then pointing out that there were a good many institutions growing up which professed to teach driving, but actually did nothing of the kind, we observed "the evil which is growing must be nipped in the bud. We trust the Automobile Club may see its way to taking the matter in hand, and so add to the long series of valuable services which it has performed on behalf of the movement." The scheme for granting drivers' certificates, now agreed upon, should prove one of the most effective methods of doing this. No employer is likely in future to be content either with a driver who does not possess the club certificate, or with one who presents a certificate of some unknown institution. The result will probably be that most schools undertaking to teach driving will now really teach it, so that their pupils will be able to gain the club diploma.

But Some Difficulties Remain.

Too much, however, must not be expected, at any rate just at first. The non-possession of the club certificate should, in most cases, prevent any sensible owner from employing a driver who may apply for a situation. But employers must not run away with the notion that it will ever be possible for a body like the club to guarantee by any examination that a driver who holds

its certificate is essentially a man who can be relied upon in every emergency, and it is in the emergencies that the real capabilities of a driver are shown, while it is failure in emergencies which causes a large number of the accidents which take place. The most that the club, or the club committee who deal with the subject, will be able really to do, is to ensure that drivers have a general knowledge of the principles of the cars they undertake to drive, and manifest a reasonable acquaintance with the art of driving. From this point of view the guarantee afforded by the certificate will be mainly, therefore, as already pointed out, negative; but even so its value will be very great, and the scheme should certainly have the effect of going a long way towards solving the driver difficulty.

As regards owners' certificates, probably most members of the club, at any rate, will be glad to possess them. Though it cannot, of course, be made a rule of membership, it is to be hoped that the general feeling in the club itself, and also in all the provincial clubs, will be strongly in favour of making it a custom. The club will then have in its hands, by the power it will exercise of withdrawing certificates, the very best possible means of restraining reckless drivers, and nothing, as we have over and over again pointed out, is of more importance to the future of the industry, and particularly to the prospects of obtaining more liberal legislation when the time arrives, than this.



The Monaco Boat Races.

THIS year's aquatic Gordon-Bennett at Monaco has the appearance of a chapter of accidents, not to say a catalogue of catastrophes. In fact, we do not call to mind any automobile event in which there has been quite so unfortunate a sequence of casualties as has taken place this year at Monaco. At first sight it all looks very shocking, and the fateful word "fiasco" has been largely used in connection with the events in the columns of the daily press. We are not quite sure that the unfortunate circumstances referred to merit this designation, although it must be admitted that the organisers of the events are not to be altogether congratulated. Had more thought been expended on the rules and regulations, above all, had more consideration been shown for the competing boats, we cannot say in the selection of weather, but in prohibiting the races when the weather was too bad, the number of casualties would certainly have been smaller. In fact, had the organisers borne in mind that a large proportion of the competing craft were essentially fair-weather boats, the results would have been apparently more satisfactory. But while in these respects some amount of want of judgment may be attributed to the organisers, nothing but praise can be accorded to the sportsmanlike and even courageous behaviour of the competitors, who put to sea and bravely struggled for victory under conditions which proved hazardous to say the least of it. Motor boats in general, even as we knew them last year, when they successfully raced across the Channel, were originally designed entirely with a view to work in calm water, but their magnificent capability of attaining, for their length, phenomenal speeds through the water, has given rise to roseate visions of their employment to a large extent at sea, and particularly for naval purposes, for scouting, and as pinnaces, and the like, in connection with regular battleships. The value of the motor boat

as a scout was singularly demonstrated last year, it will be remembered, by "Napier Minor," in connection with the manœuvres held on the Essex coast. But before we can say what the future of the motor boat is likely to be, and how far it can be really relied upon for "blue water" service, whether for naval or other purposes, it is indispensable that we should know what, on its present lines, it can accomplish, and how far those lines must be modified to give it greater reliability and serviceability at sea. It is only by severe tests in the hard school of experience that these things can be learned. Only by the knowledge gained, often dangerously enough in the races of the past, has the modern motor car been developed, and it is to the credit of the water automobilists and of the countries represented that pilots and mechanics showed themselves so ready to undertake the drastic and risky tests which the conditions prevailing at Monaco imposed. It is, we believe, almost as much to this plucky spirit, as to the growth of mechanical ingenuity and ability, that the rapid development both of the motor car and the motor boat is attributable, for it is by qualities of this kind that man's mastery over Nature has gradually been won—*sic fortis Etruria crevit*.

♦ ♦ ♦ And Their Lessons.

It is already clear that something has been learned from the accidents and mishaps, though it will be a long time before we can say that all the lessons that may be derived from them have been fully appreciated. First and foremost amongst these, of course, is that the build of some of the motor boats that competed at Monaco is not suited for regular service in the open sea. There have been no restrictions on the cylinder capacity this year, and the builders have accordingly been left to work out their own ideas as to the maximum engine power which the particular hull they have chosen will stand in practice. That some constructors have over-engined their craft has been obvious; the loss of the "Panhard," for instance, was, according to the Comte de Vogüé, the result of the severe strains to which its light hull had been subjected in the long 200 kilometre race, which it won at such high speed. Something of the same kind, too, may explain the anomalous behaviour of several other boats, which, after developing unmistakable signs of great speed, suddenly, and without apparent reason, came to grief. As the observations of competitors come to light, we shall gradually attain more definite and most valuable data, and there can be no doubt that from these very accidents, motor boat builders of all countries will learn considerably.

♦ ♦ ♦ An Awful Example.

THERE is a lady living at Singapore who once was— we hesitate to say she still is—an enthusiastic automobilist. Her enthusiasm was such that, when in this country last November, she purchased a car, and arranged for it to be carefully packed and shipped to Singapore at the earliest convenient date. As will be seen by a letter published in our correspondence columns, the car in question was not dispatched until more than a month had elapsed, and when it ultimately arrived at Singapore it was in a pitiable condition. The whole car, from its appearance, according to our correspondent, leaves no doubt that, from the time it was purchased till the date it was dispatched, it must have seen constant and severe

service on the roads. The feelings of the enthusiastic lady automobilist who, after paying a considerable sum in advance for the car, ultimately received a dilapidated and decrepit object of the kind described, can be more easily imagined than described, and the enthusiasm with which she is likely to refer to the firm which treated her in this manner, and all its ways and works, would probably do the managers of that concern good if they could hear it. We are always impressing upon motor car manufacturers in this country the advisability of cultivating the Colonial trade, and doing everything in their power to produce a good impression amongst the rapidly-growing body of automobilists in our Colonies and Dependencies, where interest in automobilism is becoming quite as keen as it is at home, and where the market, particularly for English cars, promises to increase with amazing rapidity in the near future. In the Colonies, too, it must not be forgotten that the English manufacturer is exposed to specially keen competition, on the part of French, German, and American manufacturing firms. The extent to which scandalous neglect, or rather absolute breach of trust of this kind, can injure the whole British trade in an important and growing colony, can hardly be over-estimated. It is to be hoped that all British motor car builders doing a Colonial trade will look upon the case to which we refer, in its cynical contempt of the principles not merely of sound trading but of the most elementary obligations of honour and good faith, as an awful example to be sedulously avoided, as otherwise the star of the British manufacturer is not likely to remain long in the ascendant in British Colonial possessions.

♦ ♦ ♦ Playing into the Enemy's Hands.

It was said of the great Helmuth von Moltke that "*er konnte in sieben sprachen—schweigen*" ("in seven languages he could keep silence"), and it is quite evident from the proceedings in the Wolverhampton Police Court that the best thing the motorist can do when his car collides with another vehicle is to keep his mouth shut as tightly as he can. This, at any rate, is the conclusion to be drawn from the proceedings at the Wolverhampton Police Court regarding the terrible smash on the Holyhead Road, when Mr. Lisle's Gordon-Bennett racer collided with a carrier's van, killing the horse that was drawing it on the spot, and injuring the passengers it contained. Mr. Lisle was in consequence arraigned before the Wolverhampton Magistrates, and it was stated that he had been heard to declare after picking himself up from the accident that he was *only* going at *60 miles an hour*. One cannot help feeling some hesitation in really believing that Mr. Lisle could have made such a statement, but the declaration that he did so may probably explain the punishment meted out to him by the magistrates of a £50 fine—there were two previous convictions against him—and the suspension of his licence for two years. It is not our duty to make any attempt to decide how far in this case the convicted defendant was or was not to blame. One thing seems to emerge quite clearly from the situation, that the pace was considerable, and the dust terrific. In fact, it would appear both that the drivers of the Wolverhampton club, who were taking part in a combined run, were, in most cases unable to see their neighbours, and even (at any rate in Mr. Lisle's case), were unaware, owing to the same cause, on which side of the road they really were. Under such conditions, high speeds, or even speeds that

would be perfectly unobjectionable in the case of cars travelling along dustless roads, become not merely ill-advised, but a public danger of the worst possible kind. Not only are the lives and property of ordinary road users, as evidenced in this case, put in jeopardy, but a whole countryside is converted by such an accident into determined enemies of the automobile movement. Sociability will always prompt clubs very naturally to engage in combined runs, but every club in the country should make it a rule that in such cases where there is much dust about the most moderate speeds should be preserved. Apart from the general obligation on motorists as sensible and humane persons, there is from their

point of view the scarcely less important one of avoiding as far as possible any tendency to fan the now gradually subsiding hostility to the movement. We constantly refer to this subject, because we have the best reasons for knowing how supremely important, in view of future legislation (the time for which is now rapidly approaching), the matter is. A few more accidents like that in the neighbourhood of Wolverhampton, and we shall find in 1906 a measure passed into law of such a drastic character as will provide a shock for automobilists, and the automobile movement, from which both will be a long time in recovering.



MONACO MOTOR BOAT MEETING.

(Continued from page 469.)

ON the day following the English victory in Class II. of the Racers—described in our last issue—the boats of Class III. were down to compete over the same course of 100 kiloms. The full list of probable starters for all the events was given by us last week, pp. 466, 467. The names of only three boats were on the programme for Class III., and of these the "Panhard" was unfortunately unable to start, owing to an accident which

damaged her hull. This race, therefore, became a match between "Pi-Ouit IV." and "Le Dubonnet" the latter having engines rated at 400-h.p. A disappointment awaited those who expected to see these boats do great speeds, because, in the event, neither of them equalled — except for one lap each — even the worst of the times made by "Napier II."

The engines of the larger boat gave trouble during the



MONACO MOTOR BOAT MEETING.—The anchorage for the competitors. The boats in the picture are easily identified by the numbers. They include: No. 47, "Mets-y-En II"; 14, "Palaisoto I"; 12, "Napier II"; 44, "Chant. d'Antibes II"; 45, "Chant. d'Antibes III"; 48, "Bigot Delahaye"; 46, "Titan III"; 81, "Héracles III"; 91, "Henriette"; 4, "Janus"; 50, "Fiat X"; 38, "Takumono"; 34, "Titan VI"; 56, "Chant. d'Antibes IV"; 54, "Tétu."

third round, but she completed the full course, and passed the winning line over thirty-seven minutes behind "Pi-Ouit IV." From the detailed times which we give below, it will be noticed that the times for each lap made by "Le Dubonnet" are very erratic, and give no indication of any latent speed which might reasonably be expected from her enormous engines.

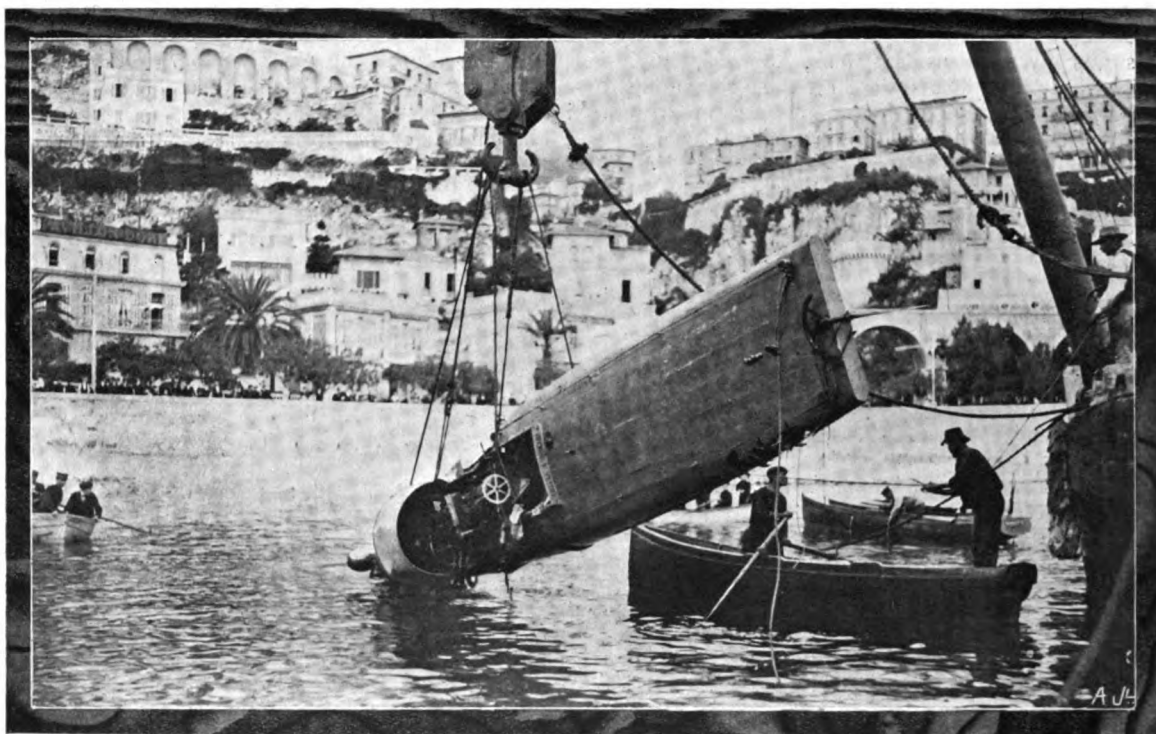
The French enthusiasts were again doomed to disappointment over the cruiser contest which took place the same day. The cruisers of Class III. had a total distance of about 85 kilometres to cover, viz., from Monaco to Nice, then on to Antibes and back to Monaco, a final journey from Monaco to Mentone and return, being also included. This course, as well as those for the other classes of Cruisers and for the Racers, was indicated on the charts which we published last week. Seven boats started, viz., "Delahaye I.," "Berliet V.," "Elise," "Chant. d'Antibes IV.," "Féfé I.," "Le Têtu," and "Fiat X." Of these all were French, with the exception of "Fiat X." which is built by

similar engines, but their hulls are the work of the two great rival constructors, Tellier and Pitre. The Tellier hull was in this instance the winning boat, the other boat, "Delahaye I.," although the third to arrive, being about 6 mins. behind "Têtu."

The results and total times for this event are as follows:—"Fiat X.," 2 hrs. 36 mins. 33 secs.; "Le Têtu," 2 hrs. 44 mins. 6 secs.; "Delahaye I.," 2 hrs. 50 mins. 9 secs.; "Berliet V.," 3 hrs. 2 mins.; "Elise," 3 hrs. 29 mins. 34 secs.; "Chant. d'Antibes IV.," 3 hrs. 39 mins. 12 secs.; "Féfé I.," 3 hrs. 40 mins. 14 secs.

Times Per Lap for the Racers of Class III.

Lap:—	1.	2.	3.	4.	5.	6.	7.	8.	Total.
	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.
Pi-Ouit IV.	24 56	29 11	22 22	35 22	48 22	51 23	20 23	10 3	10 53
Le Dubonnet	24 6	23 53	56 34	27 20	21 22	28 33	22 41	23 35	3 48 6

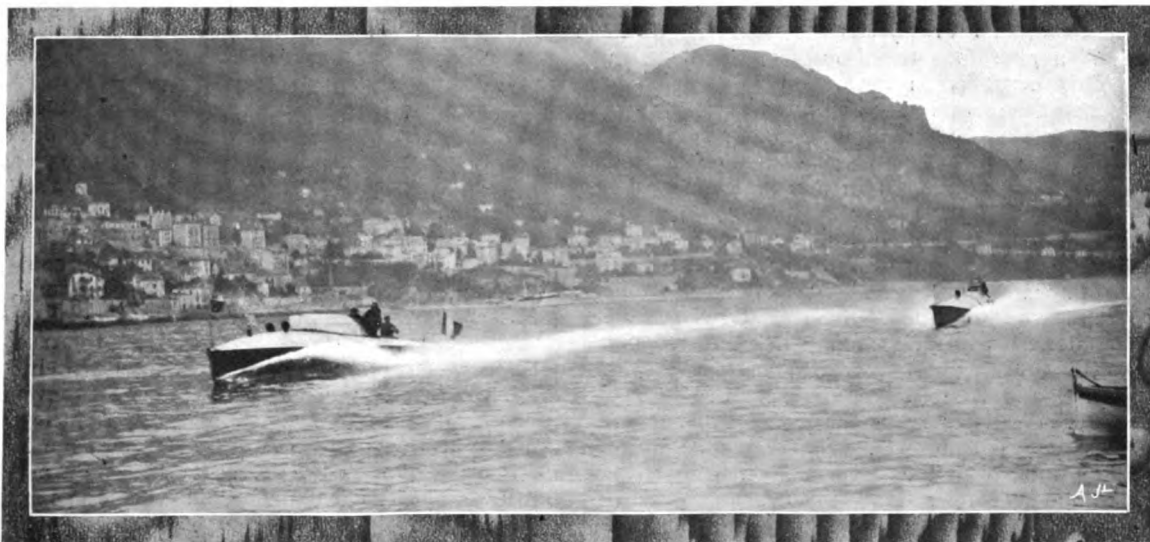


MONACO MOTOR BOAT MEETING.—Salving "Tréfle-à-Quatre" after she was sunk in the harbour in order to extinguish the fire which was consuming her.

the famous Italian constructors of the Fiat car. All the boats completed the course, but "Fiat X." came in first, nearly 8 minutes before the next boat ("Le Têtu") arrived. Once "Fiat X." had to stop owing to the rudder getting fouled, but the trouble was only momentary, and she was quickly under way again to complete the course at an average speed of approximately 33 kiloms. per hour. It was another foreign victory and, as M. Georges Prade remarks, apropos of the loss of supremacy by the French builders, "It is quite unnecessary to underline the fact in order to draw attention to a peril which all the world has already discovered."

Not a little interest was centred in the struggle between "Têtu" and "Delahaye I." Both these boats have

No events for racing boats being down on the programme for Thursday, public interest was mainly centred in the contest between the big cruisers of Class IV. The three competitors of this class were "De Dietrich II.," "Mercedes C.P.," and "Chant. d'Antibes V." The course was 140 kiloms. in length, and lay from Monaco to Nice, then back along the coast to San Remo, returning once more to Nice, and finally going back to Monaco. The race was anything but exciting, for the boats are not, strictly speaking, speedy, and the length of the course was such that there was plenty of time for enthusiasm to cool. In good time, however, "De Dietrich II." came in first, having accomplished the task in 4 hrs. 41 mins. 25 secs., equivalent to a speed of about 29.85 kiloms. per hour. Second to return was



MONACO MOTOR BOAT MEETING.—The Championship of the Sea over 200 kilometres. "Dubonnet" leading on the second round, closely pressed by the Napier boat.

"Mercedes C.P.," which took 5 hrs. 21 mins. 23 secs., and made an approximate speed of 26.14 kiloms. per hour. "Chant. d'Antibes V." also completed the course, but occupied 6 hrs. 23 mins. 47 secs. in the run.

The event for fishing boats was also run off on Thursday, the course being from Monaco to Antibes and return, a distance of 74 kiloms. The principal interest of this race was centred in the performance of the engines of "Henriette" and "La Mouette," the one using paraffin and the other alcohol. "La Physalie" and "Héracles II." were the other competing boats in this class. The result of the race was that "Henriette" won in 5 hrs. 48 min. 25 secs., with "La Mouette" second in 6 hrs. 31 min. 27 secs. Neither of the other

two boats were classed, although "La Physalie"—which has a displacement of 13 tons and an engine of only 24-h.p.—subsequently arrived after the time limit.

"Le Dalifol" won the race for pinnaces, which took place in the afternoon over a 25 kilom. course. The only other competitor was "Yvonne," the times being 1 hr. 44 min. 5 secs. and 2 hr. 20 min. 11 secs. respectively.

A most unfortunate incident took place in the harbour during the day. "Trèfle-à-Quatre" caught fire and had to be scuttled in order to put out the flames. The boat has been subsequently raised, however, and this latter incident forms the subject of one of our illustrations.



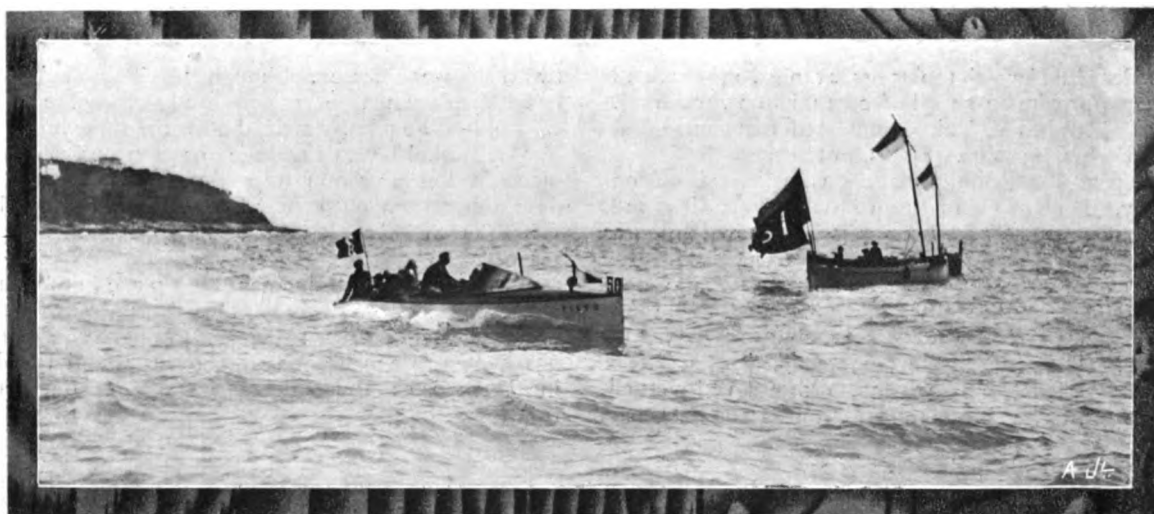
MONACO MOTOR BOAT MEETING.—The Panhard and Levassor craft which won the 200 kilometre race in the record time of 4 hrs. 22 mins. 34 secs., thereby securing the Championship of the Sea, and which sunk suddenly on Saturday when competing in the big racing handicap, steered by Comte de la Vogue.

The great event for Friday was the "Championship of the Sea," a race open to all boats up to 18 m. in length. This event is an innovation in this year's programme, and created intense enthusiasm, it being a scratch race and run over the long distance of 200 kiloms. (125 miles). The course lay over the same pentagonal route which has been followed in the other events for racers, and consisted of 16 laps. Twenty-one boats passed the starting-line, "Mercedes C.P." very quickly getting to the front, and going at high speed. After her came "Panhard," "Napier II.," "La Rapiere" and "Napier," in the order named. Soon after the second lap the fast Mercedes boat once more disappointed her supporters by breaking down. "Panhard" was thus given the lead, and the order of the next three boats remained unchanged for several rounds. After completing the seventh lap, however, "Napier" broke down, having had trouble with the gear-box. Then after the eleventh round "Napier II.," to everyone's great disappointment, also gave up, the stresses on the hull having presumably strained the engine foundations. The

50 kiloms., 1 hr. 3 mins. 44 secs.; 75 kiloms., 1 hr. 35 mins. 57 secs.; 100 kiloms., 2 hrs. 7 mins. 35 secs.; 125 kiloms., 2 hrs. 39 mins. 8 secs.; 150 kiloms., 3 hrs. 11 mins.; 175 kiloms., 3 hrs. 46 mins. 21 secs.; 200 kiloms., 4 hrs. 22 mins. 54 secs.; 50 knots, 1 hr. 57 mins. 20 secs.; 100 knots, 3 hrs. 43 mins. 5 secs.

The event for yachts (18 m. to 25 m.) was also down for Friday. But little interest, however, was centred in this item, for it was merely a "walk-over," Mercedes-Mercedes, the only competitor, doing the course (of 125 kiloms., Monaco, San Remo, Nice, Monaco) in 6 hrs. 25 mins. 12 secs.

Two important events—the handicaps for cruisers and racers—were down for Saturday. Unfortunately, owing to an accident to Panhard, only the former event was brought to a successful conclusion. The course for the cruisers was over a distance of 42 kiloms., from Monaco to Nice and return. "Le Nogentais" won the handicap, but "Dietrich II." actually accomplished the distance in the least time. The net times, and also the handicap times for the event, are given in an adjoining table.



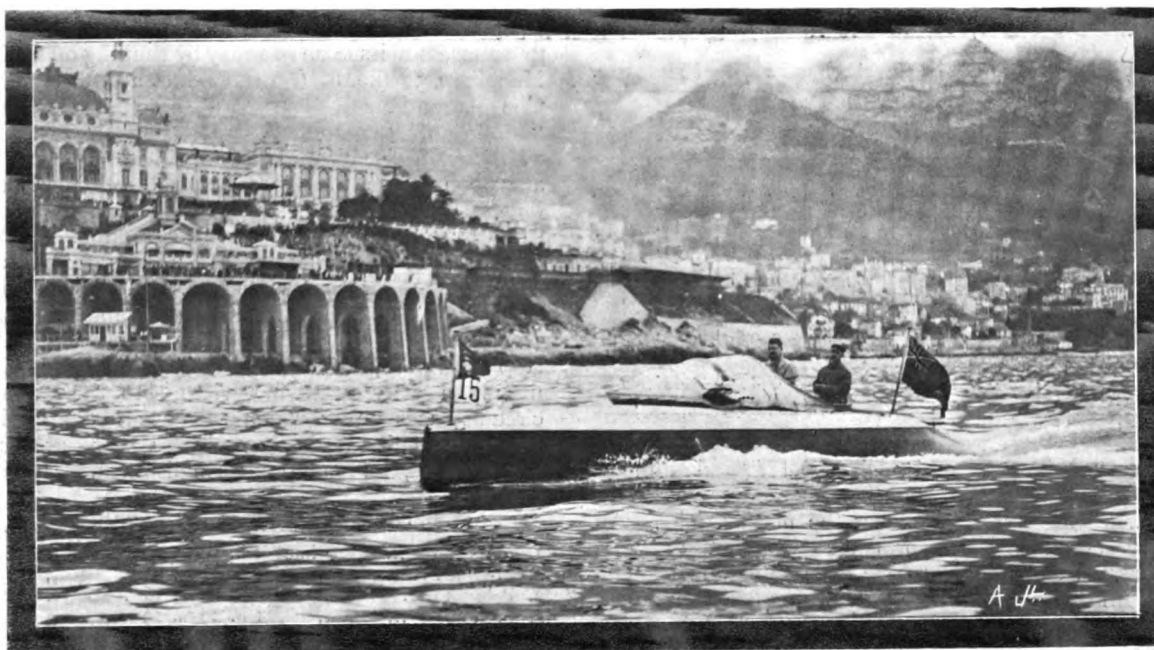
MONACO MOTOR BOAT MEETING.—"Fiat X" rounding the buoy at Cabbe Roquebrune. This boat was the winner in Class III of the Cruisers.

Panhard still maintained her pace, however, and eventually won the race in 4 hrs. 22 mins. 54 secs., a really good performance, giving a mean speed of 24.8 knots. Although there was no "Championship of the Sea" event last year, yet the racers of Class II. had to cover an equivalent distance, "Trèfle-à-Quatre's" time for that event being 5 hrs. 16 mins. 51 secs., equal to an average speed of 20.6 knots per hour.

Only eight boats finished the course, the following being their order of arrival and the times occupied by each:—1. "Panhard-Levassor," 4 hrs. 22 mins. 54 secs.; 2. "La Rapiere," 5 hrs. 14 mins. 8 secs.; 3. "Palaisoto II.," 5 hrs. 32 mins. 55 secs.; 4. "Madrioto," 5 hrs. 46 mins.; 5. "Le Têtu," 6 hrs. 4 mins. 57 secs.; 6. "Pi-Ouit IV.," 6 hrs. 40 mins. 6 secs.; 7. "Delahaye I.," 6 hrs. 53 mins. 39 secs.; 8. "Elise," 7 hrs. 35 mins. 8 secs. Of these boats three are cruisers, viz., "Têtu," "Delahaye I.," and "Elise," and it will be noticed that "Le Têtu" actually did better time than the racer, "Pi-Ouit IV." The performance of "Panhard" constitutes a record for motor boat speeds, the following being the times occupied for various distances *en route*:—

Result of the Cruiser Handicap.

Order of Start.	Boat.	Time.			Place.
		Start p.m.	Finish p.m.	Net.	
		h. m. s.	h. m. s.	h. m. s.	
8	Le Nogentais	2 14 0	4 2 38	1 48 38	1
10	Elise	2 23 0	4 6 46	1 43 46	2
6	Mets-y-En II.	1 57 0	4 7 35	2 10 35	3
3	Delahaye V.	1 52 0	4 9 32	2 17 32	4
14	Delahaye I.	2 45 0	4 10 42	1 25 42	5
15	Le Têtu	2 46 0	4 10 59	1 24 59	6
16	Dietrich II.	2 48 0	4 12 11	1 24 11	7
1	Berliet V.	1 30 0	4 13 28	2 43 28	8
5	Titan III.	1 56 0	4 20 22	2 24 22	9
4	Takumono	1 55 0	4 21 57	2 26 57	10
2	Joliette III.	1 37 0	4 22 54	2 45 54	11
3	d'Antibes II.	1 52 0	4 22 55	2 30 55	12
7	Bigot	2 10 0	4 25 47	2 15 47	13
12	d'Antibes V.	2 40 0	4 34 8	1 54 8	14
5	Delahaye VI.	1 56 0	4 45 56	2 49 56	15
11	Excelsior VII.	2 27 0	4 51 19	2 24 19	16
13	Mercedes	2 41 0	4 22 32	1 41 32	17



MONACO MOTOR BOAT MEETING.—"Baby II" which, although only a 30 ft. boat, had to race against the 12 m. boats of Class II, in which event she made a most creditable performance.

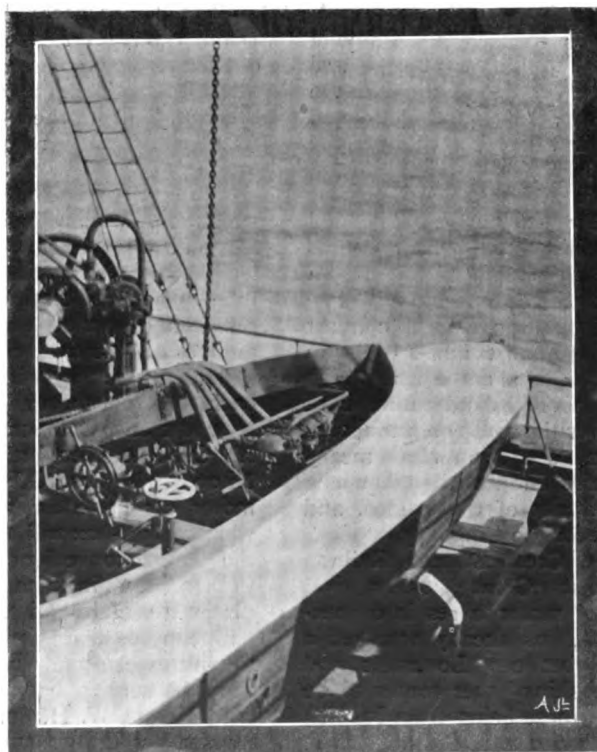
The Racers' Handicap, which was started during the afternoon, aroused greater enthusiasm than had the cruiser contest. The weather was excellent and the sea calm, so that everyone looked forward to a successful run. "Baby II." was the first to be sent off, and "Panhard" the last to leave, ten other boats being dispatched at intervals between these two extremes. Shortly after passing the third buoy, "Panhard" suddenly disappeared beneath the water with a completeness which was positively startling. "Pi-Quit IV." and an official boat quickly went to the rescue, and took on board the three occupants of the ill-starred craft. M. le Comte de Vogüé—who was at the helm—is reported to have said that the wreck was due to the severe stress on the hull owing to the high speed, and that the sudden breakdown may be attributed to the hull having been strained during the "Championship of the Sea" event, which that boat won in such splendid record time.

Owing to this mishap to "Panhard" the entire race was at once declared "off," and the committee determined to postpone it until Monday. Notwith-

standing the signals, however, several boats still continued to race round the course, in sublime unconsciousness that they were merely wasting their fuel.

Sunday proved one of the most interesting and eventful days of the week, for "Dubonnet," whose performance has hitherto been disappointing, was at last persuaded to give an account of that 400-h.p. which her engine is reported as being capable of developing. To such good effect did the boat respond to the call made on her, that she won for herself the honour, not only of having made the fastest time at this year's meeting—which brings her owners the Prince of Monaco's Cup—but of having established a new record speed of 1 min. 8½ secs. for the flying kilom., which is equivalent to a mean speed of about 28.4 knots per hour. The next highest speed in this event was made by "La Rapiere," an 8-m. boat, which accomplished the kilom. in 1 min. 16 secs., and the third fastest ("C.G.V."), 1 min. 22½ secs.

There were six competitors in this event, which was run off in three heats over a distance of 2,852 metres the first 1,852 metres of which constituted the standing



MONACO MOTOR BOAT MEETING.—A view of "Baby II," showing her engines and exhaust pipes, on board the ss. "Autolan" en route for Monaco.

mile, and the last 1,000 metres the flying kilometre.

Result of the Standing Mile (Marine) and Flying Kilometre.

Heat.	Place.	Boat.	Standing Mile.	Flying Kilom.	Total.	Mean Speed over Kilom.
			m. s.	m. s.	m. s.	kils. per hour.
1	1	La Rapiere	2 31	1 16	3 47	47' 368
	2	Madrioto ...	2 52	1 27	4 19	41' 379
2	1	C.G.V. ...	3 3½	1 24½	4 28½	42' 453
	2	Fiat X. ...	3 29½	1 48	5 17½	33' 333
3	1	Dubonnet ...	2 30	1 8½	3 38½	52' 325
	2	Dietrich II.	2 8	1 42	3 50	35' 294
Final	1	Dubonnet ...	2 30	1 9	3 39	52' 174
	2	La Rapiere	2 29	1 16	3 45	47' 368
	3	C.G.V. ...	3 1½	1 22½	4 24	43' 583

The third heat was, perhaps, the most interesting, being between "Dubonnet" and "Dietrich II.", and although "Dubonnet" made the better total time, yet "Dietrich II." was the faster boat over the marine mile. An equally noteworthy performance was that of "La Rapiere," which has really done remarkably well throughout the meeting. The time of this boat over the kilom., both in the heat, which she won, and the final, in which she was second, were identical, and the equivalent speed of this little 8-metre boat was approximately 25·7 knots per hour, or only 2·7 knots per hour less than "Dubonnet"—a boat 2·3 ft. longer and having four times the engine power!



RAILWAY AND MOTOR 'BUS EXTENSION.

THERE was a field day for all interested in the extension of motor car traffic in the Cheddar Valley district on April 6th inst. The Great Western Railway Company, which is particularly energetic and progressive as regards developing motor 'bus services to feed its outlying stations in country districts, has added to the several motor 'bus lines which it has already inaugurated in the West of England, a service of Clarkson 'buses to run between Cheddar and Burnham—passing through the historic Wedmore Mark and Highbridge—a distance of 14 miles, on which route there will be four trips every day, excepting Sundays. The vehicles used, the general arrangements of which are familiar to the readers of this journal, are designed to carry 19 passengers, and also a considerable amount of luggage on the roof. The district which the new motor 'bus service will connect up to the railway is one of the most inaccessible in Somersetshire, and the amount of local enthusiasm which prevailed on Thursday, when the Press and a number of local dignitaries were taken over the route on a trial run, was sufficient evidence for the need of improved means of communication in the district, and may be taken as a guarantee of the future popularity of the service, and its probable high-paying value for the Company.

Almost simultaneously, the Great Eastern Railway Company, which is running its Great Western rival rather close as an organiser of motor 'buses in connection with its outlying districts, has already arranged a valuable and useful service between Lowestoft and Southwold, and is also establishing other routes to be served by motor 'buses, one of these being from Ipswich to Shotley, another from Lowestoft to Oulton Broad, while a third is a regular cross-country run from Trowse, near Norwich, to Beccles. On this line there will be several services daily. Nearer London additional ser-

The last day of the actual racing at Monaco was brought to a successful issue on Monday by running off the Racers Handicap, 50 kiloms. (postponed from Saturday) and the Consolation Races. The first of these events was won by "Madrioto," "Pi-Ouit IV." was second, "Palaisoto I.," "C.G.V.," and "Baby II." coming next in order. In the afternoon, when the Consolation Races were run off, only "Baby II.," out of twenty-five entrants, was in a fit state to compete in the racers' section, which was consequently a "walk-over." "Baby II." has been a credit to her constructors, J. W. Brooke and Co., throughout the meeting, having completed four out of five races, and each of the four being a "non-stop" run. Although a consolation race is not usually a very gratifying victory to the winner, the circumstances under which this event was carried off by "Baby II.," in 2 hrs. 19 mins. 4 secs., are such as her builders, and all other Englishmen, may well be proud of.

Results of the Racers Handicap (50 kiloms.).

1. Madrioto ...	Net time	1 h. 17 m. 0 s.	Allowance	17 m.
2. Pi-Ouit IV. ...	"	1 h. 24 m. 28 s.	"	23 m.
3. Palaisoto II. ...	"	1 h. 18 m. 36 s.	"	17 m.
4. C.G.V. ...	"	1 h. 20 m. 19 s.	"	13 m.
5. Baby II. ...	"	2 h. 4 m. 35 s.	"	37 m.

In the Cruiser Section (25 kiloms.) the winners were:—

Class I.—"Lanturto,"	107 m. 32 s.	Class II.—"Arion IV.,"	63 m. 23 s.
Class III.—"Forçès-Pas,"	50 m. 37 s.	Class IV.—"D'Antibes V.,"	60 m. 20 s.
Fishing Boats.—"Heracles II.,"	102 m. 56 s.		

vices have been arranged for between Chelmsford and Whittell, Chelmsford and Danbury, Colchester and West Mersea, and in several other directions.

With the successful inauguration of the Milnes-Daimler 'bus service in the Isle of Wight, the first run of which was commenced from Ryde last week, when Lady Adela Cochrane, wife of the Deputy Governor of the Island, drove the leading car, it is obvious that the future satisfactory growth of motor 'bus traffic is assured. When motor 'buses can prove, as they are proving, their absolute reliability over cross country roads on surfaces which are, in many cases, far from perfection, the contention that they cannot be made to prove reliable for lengthy public service is too ridiculous to receive a moment's consideration, even were it not, as we have repeatedly pointed out, dictated merely by interested motives of a far from commendable nature.

This new service will be a circular tour from Ryde back to Ryde, through Binstead, Ryde to Totland, *via* Newport and Calbourne, East Cowes to West Cowes, *via* Osborne, Newport and Carisbrooke and Cowes to Niton. The Post Office, ready, as usual, to encourage motor car undertakings, has concluded a contract by which a post-box will be carried on each omnibus for the general convenience of the public, who will be able to post letters in them at any of the recognised stopping places, a useful proviso, as otherwise elderly ladies with halfpenny postcards might enjoy the privilege of stopping the 'buses every few hundred yards. The directors of the 'bus service have also concluded an arrangement with Messrs. W. H. Smith and Son for the delivery of newspapers throughout the island, and as in addition some 5 cwt. of parcels can be carried on the roofs of the vehicles, the whole service should prove a distinct boon to inhabitants of the island.

THE 1905 PIVOT CARS.



A 16-h.p. Pivot Limousine.

THE Pivot cars have but lately been introduced into this country from France, where they are constructed, and they were first shown to the British public at the recent Exhibition of this year by P. Cuthbertson, who has secured the sole English agency for them. In general design they do not depart very much from orthodox practice, although in one or two respects—such as operating the gears by means of a horizontal cam-plate, the fitting of a high-tension magneto in addition to the accumulators, and the provision of duplicate ignition-plugs, so that both ignition systems are entirely isolated from one another—they differ in detail. The touring cars are made in three sizes, viz., 16-h.p., 24-h.p., and 30-h.p., and as they are built on similar lines, the photographs and description which we give of the 30-h.p. chassis will apply in the main to the other sizes also.

In addition to these standard touring cars, however, a range of light cars, having engines of from 6-h.p. to 16-h.p., and heavy chassis, suitable for loads of from one to three tons, are also constructed.

The chassis, shown from the side, above, and in front, in Figs. 1, 2 and 3 respectively, is of the live-axle type, is fitted with a gear-box, giving four forward speeds and a reverse, and has a 4-cylinder engine which is capable of developing 30-h.p. The main frame is of pressed steel, and has a tapering cross section. It is narrowed in front of the dash in order to secure a wide steering lock, and is carried on semi-elliptic springs, both in front and at the rear. The rear springs lie outside the frame, and are carried in shackles at both ends, the rear axle being tied to the frame by radius-rods. The front axle is a solid forging, and it has the steering-heads formed on it. The

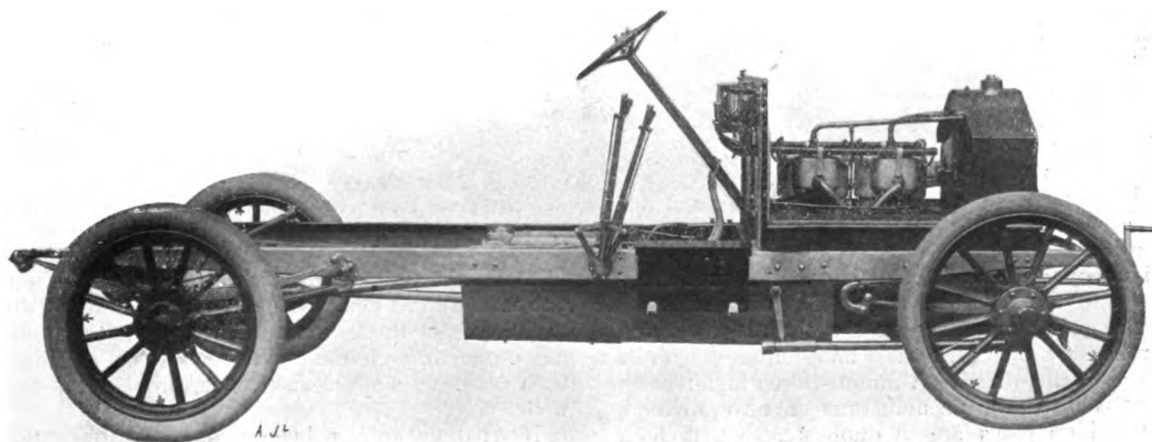


Fig. 1.—View from the side of the 16-h.p. Pivot Chassis.

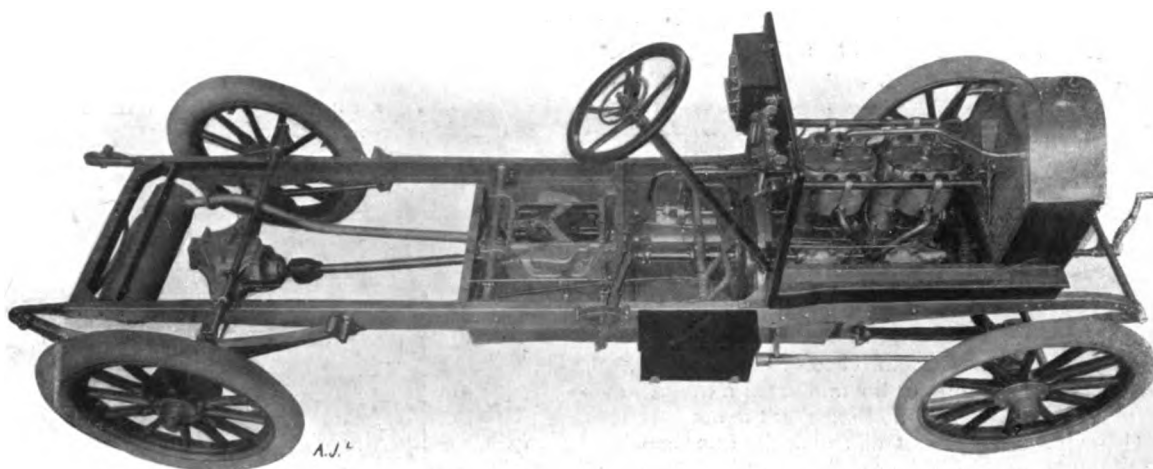


Fig. 2.—View from above of the 16-h.p. Pivot Chassis, showing the gear-box, with its cover removed.

steering-gear is of the worm and sector type, and the tie-bar lies in front of the axle. Passing across between the ends of the dumb irons supporting the front ends of the front springs is a stay rod, visible in Figs. 2 and 3, which serves to stiffen that portion of the frame.

The 4-cylinder engine has its cylinders, of which the bore and stroke is 100 mm. and 125 mm. respectively, cast in pairs, and the interchangeable, mechanically - operated valves are arranged symmetrically on either side beneath inspection covers which render them readily accessible. A "Zenith" automatic carburettor* is fitted, and the gear-wheels driving the cam-shafts lie in front, and are exposed. The radiator is of considerable size, and is built up of thin finned - tubes, arranged vertically in a casing which also forms the water tank; the combined tank and radiator have a capacity of 6 gallons. A belt driven fan is placed immediately behind the radiator, and a circulating-pump is also fitted. The engine is governed by a centrifugal governor, acting on the throttle-valve, and is controlled by the "throttle" and "timing" levers above the steering-wheel. A Simms-Bosch high-tension magnet† is fitted, but accumulators are also provided, and the ignition plugs are in duplicate, so that both ignition systems are always independent of one another, and both may be used simultaneously if desired.

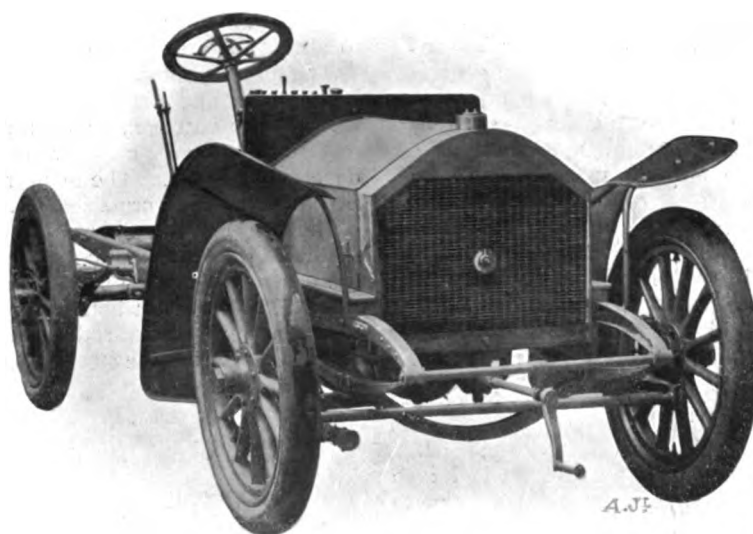


Fig. 3.—View from in front of the 16-h.p. Pivot Chassis, showing the finned-tube radiator, and the stay which passes across between the ends of the dumb-irons.

The gear-box is carried by two of the cross-members of the main frame, while, between the gear-box and the clutch, which is of the ordinary leather-faced cone type, is a short flanged shaft. The gear-box is of the sliding-spur-wheel type, and the gear-wheels are operated by a horizontal cam-plate, situated immediately beneath the detachable cover in the top of the gear-box. Four

forward speeds and a reverse are available, the top speed giving a direct-through drive to the live-rear-axle. Introducing the top-speed automatically disconnects the lay-shaft from the driving-shaft, so that the lay - shaft does not revolve when the top-speed is in use. A universal - joint is fitted at the front end of the propeller-shaft, and there is a jaw-coupling at the rear end, between the propeller - shaft and the driving - bevel of the differential-gear.

Ball-bearings and ball - thrusts are used throughout the

transmission, and the rear wheels, which are shod with 920 mm. by 120 mm. Michelin tyres, are keyed directly to the ends of the live-axle. The drive is transmitted to the frame through the radius-rods which are hinged at both ends, and a spring-suspended torque-rod is fitted as well.

Internal expanding brakes, operated by hand, are fitted to the rear wheels, and a band-brake, operated by foot, is fitted behind the gear-box.

The standard chassis has a wheel base of 9 ft., and a track of 4 ft. 6 in.

* A fully-illustrated description was given by us on February 13th, 1904.
† Described in detail on October 22nd and 29th, 1904.

THE WOLSELEY INDUSTRIAL VEHICLES.

(Continued from p. 481.)

IN this same illustration, one of the cushion-springs, B⁹, which are introduced between the adjustable radius-rods and the back axle, is very prominent. As already explained, they serve very much the same purpose as the "spring-drive" device fitted to some other makes of vehicle, for they allow the back axle to move bodily forward a short distance when there is any tendency for the vehicle to be started from rest too suddenly.

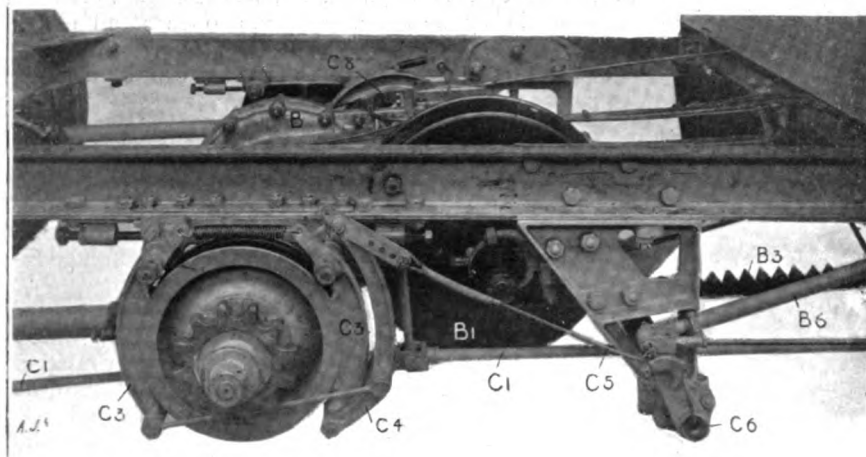


Fig. 4.—The central portion of the Wolseley Omnibus Chassis, showing the construction of the brakes on the differential countershaft.

The chassis is not only well designed to withstand the exceptionally severe strain of continuous hard work to which vehicles of this kind are subjected, but, needless to state, the materials and workmanship employed in its construction are of the very highest class obtainable. Everything has been done to ensure reliability, simplicity, and accessibility, so as to enable these machines to be successfully employed in public service work—even in the hands of those who may not have become extremely proficient as drivers. It will already have been recognised that the safety of the passengers has been very fully provided for in the matter of brakes, and that it is virtually impossible for the machine to ever get out of hand through any failure on their part. Either of the three independent brake systems is alone sufficient for holding the car, or for stopping it, on any ordinary hill, and even if one (or two) of them became inoperative through neglect, in the matter of adjustment, the driver would have ample warning before the car became at all unmanageable. The four forward speeds are equivalent to $2\frac{1}{2}$, 5, 8, and 13 miles per hour, respectively, and the "reverse" gear gives 5 miles per hour when the engine is running at normal speed.

The 2-ton Lorry.

The same chassis as that we have just described is also employed for the 2-ton lorry, which is now being supplied for the haulage of goods, the only difference being that the back wheels have steel tyres instead of rubber tyres. The vehicle can be fitted with a flat platform of large area, or with any other kind of body that may be required. For a large number of purposes, such a machine is preferable to a steam lorry, and, with the power that is available, it is capable of taking heavy loads at a good average speed. For the transport of goods, in particular, though also for use in countries where petrol is difficult to obtain, the Wolseley Company's paraffin vaporiser—of which we are now about to give some particulars—is well calculated to still further extend the useful field of these commercial vehicles.

The Wolseley Paraffin Vaporiser.

This vaporiser, which is the result of a considerable amount of experience, extending over a long period, is of that type in which the oil is converted into

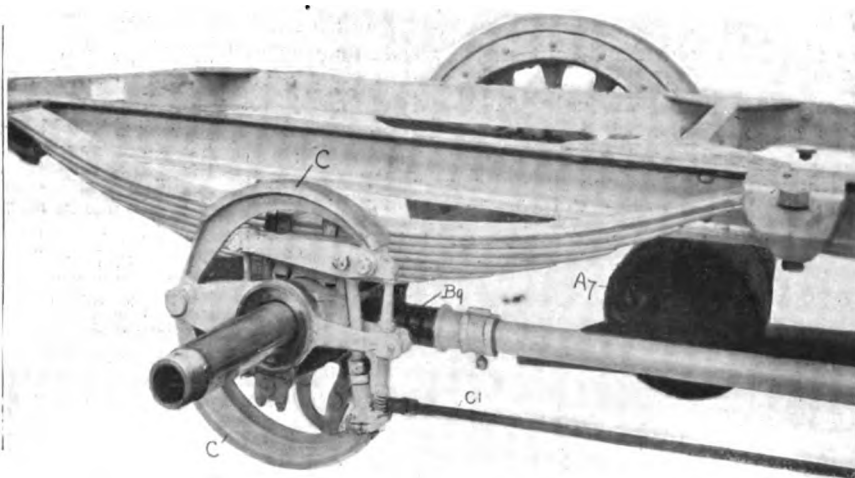


Fig. 5.—View of the rear portion of the Wolseley Omnibus Chassis, showing the construction of the internal expanding hub-brakes.

gas by passing it over a large heated surface that is kept hot by the exhaust gases. The whole of the air required for combustion also passes through the vaporiser, and provision is made by which the vaporiser can, in the first instance, be heated either by using a blow-lamp or by starting the engine with petrol. Combined with the apparatus, so as to form a part of it, is an arrangement by which the richness of the mixture can be varied over a very wide range, this being done in a very simple

manner, and in such a way as to allow the power of the engine to be controlled—when in actual use—by an ordinary throttle-valve, placed between the vaporiser and the engine.

Referring to Fig. 6, which is a cross-section through the vaporiser, it will be seen that there are two atmospheric inlet-valves, D and D¹, mounted alongside one

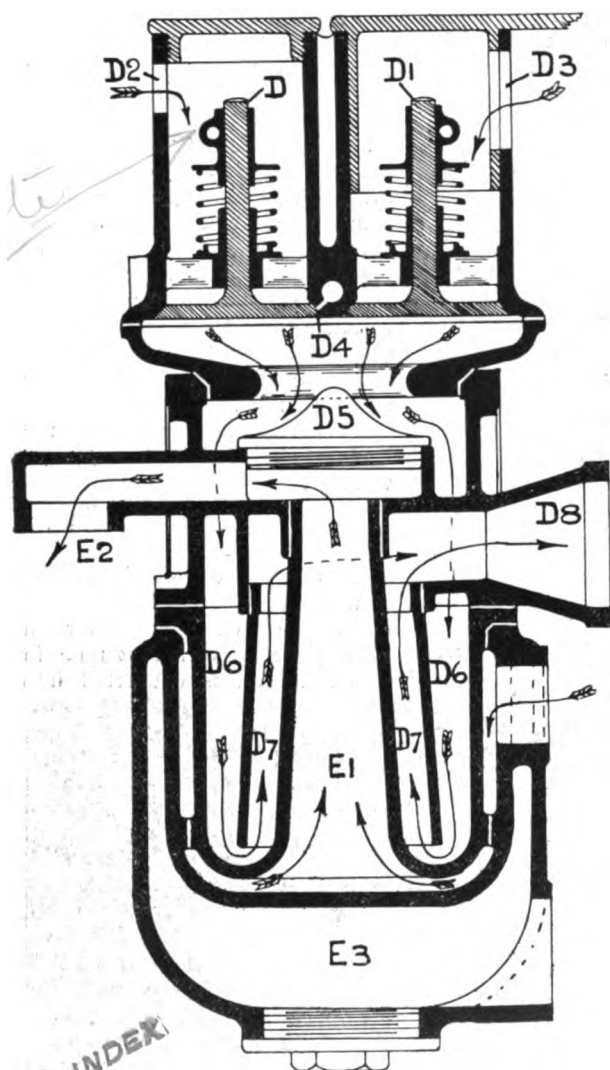


Fig. 6.—Sectional drawing of the Wolseley Vaporiser, which enables either petrol or ordinary lamp-oil to be used as fuel with their engines.

another above the main portion of the apparatus. The valve, D, is at all times equally open to the atmosphere through the port, D², but the effective area of the passage, D³, leading to the other valve can be varied by hand. The air that enters through the valve, D, takes up a certain amount of oil with it when it passes through the valve, because there are holes, D⁴, drilled through the valve-seat, and these holes communicate with the fuel

pipes. When the valve, D, is closed the holes, D⁴, are also closed by it, and the quantity of oil which flows through the holes, when the valve opens, depends upon the extent to which it is lifted off its seat by the ingoing air. The air that enters past the valve, D¹, merely serves to dilute the extra rich mixture of oil and air that enters by the other valve, and it will be recognised that the ultimate proportion of oil and air that enter the vaporiser can be entirely controlled—and can be controlled to a nicety—by varying the area of the adjustable port, D³. The strength of the valve-springs, and the area of the ports, D² and D³, are so proportioned that when the port, D², is fully opened, the valve, D¹, admits the whole of the air that is required, and it therefore follows—since obviously the valve, D¹, cannot open at all if the port, D³, be completely closed—that any degree of richness, from maximum oil to pure air, can be allowed to pass through the heated chamber.

The air and oil, drawn in through the valves, D and D¹, are caused to mix thoroughly with one another, by the “swirling” action that is set up by the conical plug, D⁵, and by the restricted orifice immediately above it. They then pass down together through the heated compartments, D⁶ and D⁷, and finally emerge to the induction-pipe through the port, D⁸.

The vaporiser is normally kept at a temperature of about 250° F. by a portion of the exhaust-gases, which are allowed to enter through the port, E, and are caused to travel—in the direction indicated by the arrows—into the central passage, E¹. Thence they pass out through the pipe-fitting, E². The temperature can be regulated by means of a by-pass cock, fitted to the main exhaust-pipe, and the temperature normally tends to keep constant, since the heat imparted to it by the burnt gases is, to a great extent, proportional to the quantity of mixture that is drawn through the vaporiser.

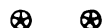
If it is desired to heat the vaporiser before starting the engine, this can be done in about seven minutes by means of a blow-lamp, the flame of which is introduced into the chamber, E³, in the base of the vaporiser. Otherwise, however, the same effect may be obtained by using petrol, instead of paraffin, to start the engine, for there are two sets of holes, D⁴, drilled through the seat of the fuel-valve, D, the two sets being fed from different supply pipes. It is then only necessary to turn on the cock for the petrol-feed, when the engine can be started immediately, and, as soon as the vaporiser has been heated sufficiently, the paraffin cock can be turned on instead.

An important feature of this vaporiser is that it is completely closed to the atmosphere when the engine is at rest, or when the throttle-valve is shut, so that no odour can escape from it, and there is no risk of fire through “flooding” or other causes. One vaporiser alone is needed for engines having from one to four cylinders, and we are told that the actual power developed by an engine fitted with it is practically the same, whether petrol or paraffin is employed; when used for petrol alone, it is, of course, necessary to shut off the exhaust-gases from the heating-jacket.

(To be continued.)



QUITE a number of presentations have been made to Sergeant Jarrett by the enthusiastic Ripleyites whose rates the fines he brought in have for so many years helped to keep down. Amongst these have been photographs of the scenes of his numerous police traps



on the Ripley Road. If to these could have been added a few snapshots of the sergeant under cross-examination in regard to some of his more recent traps (since the new Act), it would have been apparent that the laugh was not always all on one side.

THE THORNYCROFT LURRIES, OMNIBUSES, AND VANS.—PART VI.

A Special Military Lurry.

THE lurry shown in Fig. 10 has a similar type of engine—employing ordinary lamp oil—as that on the 5-ton tractor, but, instead of having only two cylinders, it has four, and, instead of being mounted in an “engine-house,” it is placed beneath a bonnet in front. The engine is seen from the left side in Fig. 11. The cylinder castings are identical with those used for the tractor. The entire machine is of extremely substantial construction, and has a live-axle, driven by a propeller-

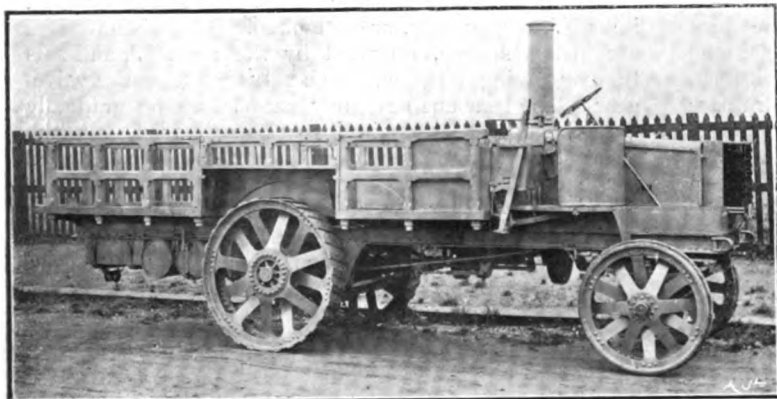


Fig. 10.—The special Military Lurry, built by the Thornycroft Company, which is propelled by a 4-cylinder engine using paraffin as fuel.

shaft from a gear-box of the sliding-spur-wheel type. The gear-box, however, has three shafts, instead of two, thus enabling the speed between the second-motion-shaft and the propeller-shaft to be sufficiently reduced. As will be seen, the platform projects a considerable distance behind the back axle, and the tanks are fixed beneath the overhanging portion.

The method adopted for the suspension of the frame is novel in many respects, for, although the springs are all of the semi-elliptic type, the front axle is rendered capable of accommodating itself to considerable inequalities of road surface by a rocking-beam, which supports the front ends of its springs, and passes across the front of the frame with a central pivot.

The rear springs are carried beneath the back axle, which is connected to the frame by radius-rods passing rearwardly, as well as by a “torque-rod.” The steering is arranged on the “Ackermann” principle. In many respects, the live-rear-axle resembles that of the tractor, for it is fitted with a winding-drum, and with means for locking the differential.

On this vehicle, the fuel is fed under pressure from the tank to a float-feed-chamber, from which it flows by gravity to the vaporiser. One vaporiser alone serves to feed all four cylinders. The cooling water is circulated through a large radiator in front, and the air that is drawn through the radiator by a belt-driven fan is forced up the chimney, where it mingles with the exhaust gases.

The Thornycroft Petrol Omnibuses.

The same chassis is employed for the ’buses whether they are of the single-deck or of the double-deck type, and this is fitted with the new 24-h.p. four-cylinder engine of which we gave a fully-illustrated description on February 11th last. The engine has, it will be remembered, separately cast cylinders of $4\frac{1}{2}$ ins. bore by 5 ins. stroke, and is capable of developing about 30-b.h.p. at 1,000 r.p.m. The single-deck bodies usually employed have a seating capacity for 20 passengers, and the double-deckers accommodate 34 passengers; one of the double-deckers, built for the London Motor Omnibus Company, is shown among the illustrations accompanying this article. These vehicles are geared to run at an average speed of about 12 miles per hour, and are capable when fully loaded of ascending gradients of 1 in 8.

The special features of the chassis, apart from the “spring-drive” device already described, are that a single chain is employed for driving the live-axle, that the hand-brake acts on the shell of the differential-gear, and that the main clutch is of the multiple-disc type, while a further characteristic, which should be borne in mind, is that the new engine has a lubricating-pump fitted in the crank-chamber for automatically circulating the

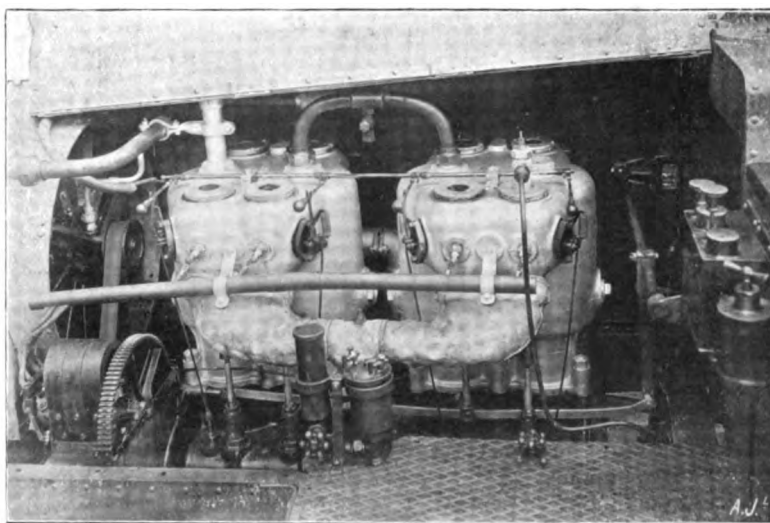


Fig. 11.—View, from the left side, of the 4-cylinder engine fitted in the Thornycroft Military Lurry, showing the fan, the magneto, the low-tension igniters, the high-tension ignition-plugs, and a portion of the vaporiser.

oil through the bearings. The channel-frame is nearly a foot narrower in front of the dashboard than it is to the rear of the gear-box, and the side-members gradually converge towards one another between these points. The frame is supported above the axles on semi-elliptic side-springs, but an unusual feature of the rear springs is that they pass beneath the axle, instead of above it. No shackles are employed for attaching the springs to the frame, sliding-shoes being employed instead.

(To be continued.)

THE LATEST CLARKSON STEAM 'BUSES.

(Continued from page 477.)

FITTING over the sleeves, and pressing them up against the detachable cover-plates in front of them, are springs, A⁷, which, being merely iron castings (not coiled steel), are totally unaffected by changes of temperature, and yet have ample elasticity for ensuring a face joint at the front ends of the sleeves, A⁶.

One of the pistons, A⁹—with its connecting rod, A¹¹—is also shown separately in Fig. 6, and it will here be seen that the cross-head, A¹⁰, is made in one solid piece with the piston-rod. These portions of the engine—as also the piston-valve, A⁸—are finished with the very greatest accuracy that is now possible to obtain, for the success of the metallic packing device, above described, depends largely upon it; the abolition of ordinary stuffing-boxes—which require frequent adjustment—is so great an improvement as to fully warrant the extra care. The connecting-rods, A¹¹, are made from steel stampings, and the gudgeon-pins, which are hollow, are—like most of the other parts of the engine and transmission-gear—ground true after hardening.

Our illustrations very clearly show the manner in which the engine is constructed, with the aluminium crank-chamber casting, B, merely serving as an oil-tight casing surrounding the moving parts. The cast-iron bed-plate, B², carries the two bearings for the crank-shaft, B³, and is connected direct with the crosshead-guides, A⁴, by eight steel columns, that take all strain. The columns also serve for carrying the castings, L⁴ and L⁵, which support those portions of the "Joy" valve gear to which the reversing quadrants, L⁴, and the pivoted links, L⁷, respectively, are attached. The piston-valves are, in this system, operated by the rods, L⁶, and it is the connecting rods, A¹¹, which actuate the entire valve-gear. The gear enables the "cut-off" to be gradually varied, and the engine to be reversed, all the necessary variations resulting from the slotted guide blocks, L⁴, being rocked about their fulcrums. This rocking motion is imparted to them by the links, L³, which are connected with the lever-arms, L², that lie in the base, B¹, of the crank-chamber. The lever-arms,

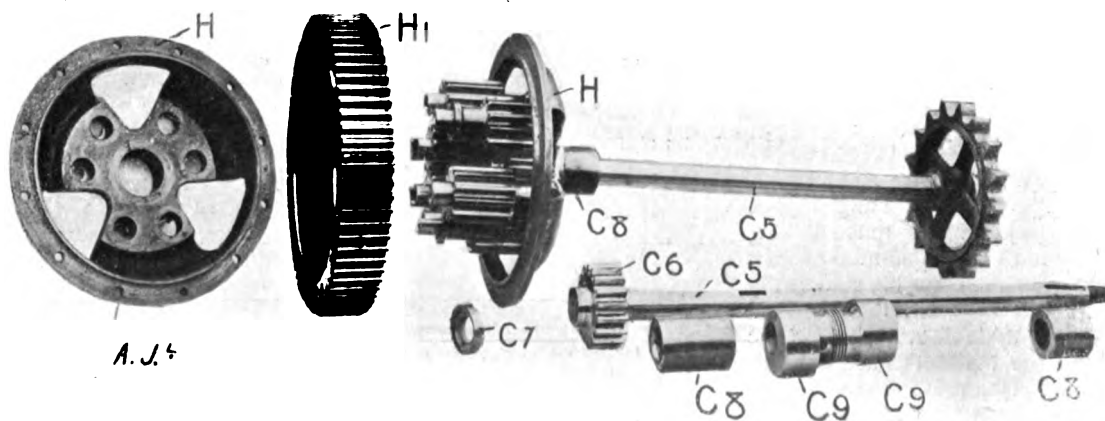


Fig. 7.—Portions of the Clarkson differential countershaft, showing the differential gear dismantled, and also showing one of the shafts, C⁵, with its pump-operating eccentric-blocks, C⁶, and its brasses, C⁸.

The pistons and the piston-valves have the rings arranged in pairs—fitting close up against one another—with another wide ring beneath these rings to give them the necessary springiness, and to allow them to be fixed relatively to one another, so that the splits can never come in line. The entire composite ring thus formed—in reality by three rings—is accurately faced on each side, and is carried between two flanges, so that it can "float." Although, however, the rings are thus enabled to self-centre themselves in the cylinder, they are yet prevented from moving round relatively to the pistons, and thus it is that Mr. Clarkson has been able to employ piston-rings on his piston-valves, because he can prevent the splits in the rings from travelling over an open port. The use of piston-rings on the valves not only serves to prevent leakage of steam, but also provides an automatic relief for any water that may have collected in the cylinder, since the water will escape when the pressure is sufficient to contract the rings and let it pass; the water tends, of course, to flow from the cylinders into the valves, the latter being beneath the former.

L², are both secured to the rock-shaft, L¹, and it is this shaft which is coupled up with the hand-lever, L, beside the driver. The quadrant over which the lever, L, works has one "forward" notch only, though the lever can be moved further than the notch to give a later "cut-off" at starting. The notch represents the ordinary running position, and is equivalent to a cut-off of about three-eighths; the speed of the car is regulated in practice almost entirely by the throttle-valve.

The crank-chamber casting, B, is merely a framework to which detachable cover-plates are bolted at each side and on the top, while the base is similarly secured to the underside. The same flanges that serve to secure the castings, B and B², together, also permit the engine to be bolted to the casing, C, that surrounds the differential countershaft. The crank-shaft is formed by two separate, hollow forgings, which are bolted together through the steel spur-wheel, B⁴, and this wheel is compelled, when the engine is bolted up in place, to mesh with the phosphor-bronze wheel that surrounds the differential-gear. The standard engine, which has cylinders of

4-in. bore, by 4-in. stroke, and develops about 25-h.p., is also applicable, without any change, for the large double-deck 'bus chassis, because either one or two of them can, as required, be used, since it is only necessary to bolt the second engine to the back of the casing, C, and to let both of them drive the spur-wheel that surrounds the differential-gear.

The Transmission Gear.

The casing, C, that encloses the differential countershaft, and is formed by two aluminium castings having a vertical central joint, has pump-plates, C³, bolted to it for carrying the two pumps on either side, and has inspection-covers, C¹ and C², as seen in Fig. 2. The cover, C¹, enables the lubricator that feeds oil into the two steam-chests to be got at for inspection, and the plate, C², covers the mechanical distributor that alternatively passes the oil, delivered by the pump, G, to each bearing surface on the engine. The chief parts of the differential countershaft itself are shown separately in Fig. 7, where one half of the shaft, C⁵, is in its proper position relatively to the differential-gear, and the other half is seen with its steel-bronze bushes, C⁸, and pump-driving eccentric-blocks, C⁹, lying beside it. The shell of the differential-gear is formed by the two side castings, H, and by the phosphor-bronze spur-wheel, H¹, all of

which are rigidly bolted together; the spur-wheel, H¹, has twice as many teeth as the pinion on the crank-shaft. The side-plates, H, receive the ends of the six pins upon which the spur planet-wheels revolve, and these pins are prevented from rotating about their own axes by cutting them half away at their extreme ends, and by allowing the holes to only pass right through the castings, H, around one half of the complete circle. The concentric spur-wheels, C⁶, with which the planet-wheels engage, form a solid part of the nickel-steel shafts, C⁵, thus avoiding the use of any keys, and there is between the two shafts a loose thrust-collar, C⁷, to prevent any end play. Mounted on each of the shafts, C⁵, are the eccentric blocks, C⁹, that operate the pumps, and these, it will be noticed, have no side flanges, so that the eccentric-straps are allowed to self-centre themselves upon them. The eccentric-blocks are made in pairs from a single forging, they are keyed to the shafts, and they are kept in place longitudinally by distance tubes. Between each pair of eccentric-blocks, a worm is cut for meshing with a corresponding worm-wheel. On the right side of the countershaft, the worm-gear is made use of for operating a pair of small pumps that feed oil into the steam-chests, and, on the other side, the worm-gear drives the oil-distributor, to which further reference will shortly be made.

(To be continued.)



PREVENTION BETTER THAN CURE.

MESSRS. JARROTT AND LETTS have been carrying out in a well organised and systematic manner a scheme which in the last number of THE AUTOMOTOR JOURNAL they described with just the slightest suspicion of humour as a method of "assisting the public to regulate speed so as not to contravene the Motor Car Act." In fact, they have provided the Brighton road with a staff of eight cyclists and a motor car, and these were at work on Saturday and Sunday warning motorists not to break the law. Naturally enough their principal fields of activity were in the neighbourhood of the points where the police had installed themselves, with timing apparatus, viz., from Merstham to Povey Wood, from Povey Wood to Crawley, from Crawley to Pease Pottage Green, from this point to Bolney, from Bolney to New Timber, and thence to Brighton. The latter stretch being a nice steady run down, was, of course, particularly tempting. The operations of the cyclists were supervised by the car. On the whole, we believe, these praiseworthy efforts were successful, and but few occasions were afforded to the police for issuing summonses for excessive speed. Doubtless this will be to their satisfaction, for we gather that the proceedings on the Brighton road are of a more scientific character than has been usually the case in the past, Major Lang's electrical timing apparatus, which is said to be thoroughly reliable, being employed. In this case it is perhaps scarcely fair to speak of traps. It is also quite obvious that Messrs. Jarrott and Letts' staff cannot be accused of "obstructing the police in the exercise of their duty." On the contrary, they much more resemble special constables assisting the officers of the law to maintain order.

From one of the daily papers it would appear that Messrs. Jarrott and Letts' staff have been supplemented by some volunteer practical jokers, who pretended to be

a police trap, and occasioned a good deal of trepidation to passing motorists in consequence. As, however, the result of their operations was on several occasions to act as supplementary warners, the result was on the whole beneficial.

A WRITER in the *Referee* has been taking up the cudgels on behalf of the police, and maintaining that it is quite unfair to speak of their arrangements as "police traps." There is much to be said for this view when scientific apparatus of the kind devised by Major Lang, and used on the Brighton road, is adopted, and if its readings are really fairly and honestly produced in court. Our quarrel with so-called police traps in the past has generally been that the time alleged to have been taken for measured stretches of road always worked out with such wonderful accuracy to exactly the same number of miles per hour, quite independent of the types of car which were alleged to have obtained the particular speeds. With accurate apparatus, of course, such ludicrous coincidences would be impossible.

Magneto Ignition.—On Friday, April 14th, Mr. Horace M. Wyatt read a paper on the above subject before the members of the Auto-Cycle Club. Mr. Wyatt's opening remarks dealt with the fundamental principles underlying the construction of magnetos in general, and the remainder of the paper was given over, almost exclusively, to the description of certain types of high-tension magnetos. We do not excerpt Mr. Wyatt's paper, because, as our readers are aware, we have but recently dealt with this subject at very considerable length in a series of minutely illustrated articles which appeared in our columns, the subsequent reprint of which, now in its third edition, has itself given evidence of the increasing interest which is being taken by motorists generally in this form of ignition.

REVIEWS OF BOOKS.

The Law Affecting Motor Cars.

By W. LUCAS and A. C. CRANE.

(London: Reeves and Turner and W. A. Standring.
Price 5s.)

THIS is, perhaps, a more ambitious effort than has yet been made to deal with the rapidly growing *corpus* of our motor car laws, and a rather different method of treating the subject has been adopted to that followed by most other authors. By this we mean that the writers have arranged in a series of chapters all the principal considerations affecting automobilists in what may be regarded as a sort of natural order, giving, where necessary, chapter and verse from the Acts, regulations, and decided cases. This method possesses certain advantages from the point of view of some readers; at any rate, anyone who reads the chapters through will know practically all that he will ever probably require to know on the subject. At the same time the method is, perhaps, a little more difficult for reference, and there are advantages attaching to a regular commentary on the Acts as they stand, with cases cited in connection with them. The difficulties of reference, however, are largely overcome in the present work by a good index, and from the points of view that we have specified, the work may be looked upon as complementary to others on the same subject, which have already been noticed in our columns.

Tess's Country. "The Hardy Country."

By C. G. HARPER.

(London: A. and C. Black. 6s.)

IT is a further testimony, though indeed none is needed, to the great qualities of Mr. Thomas Hardy as an author that Mr. C. G. Harper should have written a book about Wessex with the special purpose of illustrating Mr. Hardy's novels and entitled it "The Hardy Country." It was some time ago our good fortune to peruse and review the same author's work on "The Ingoldsby Country," and that work was delightful reading. "The Hardy Country" is almost more so. Many readers will learn with surprise how much real basis of fact there was for example in "Tess of the D'Urbervilles," how thoroughly the old D'Urberville family was incorporated with the past history of Dorset and neighbouring counties, and above all how almost photographically true to the districts with which they deal Mr. Hardy's descriptions almost invariably are. The work is accompanied by a map which gives the principal places with their synonyms as described in the Hardy books, and it is wonderful what a large number of principal towns and places have been identified. In fact the identification is so general and complete that one wonders why Mr. Hardy should have taken the trouble to disguise the names at all. Mr. Harper displays in the present work the same eye for the picturesque features of landscape and countryside that charm the reader in "The Ingoldsby Country." There are pieces of really fine descriptive writing, and the way in which he absorbs and reproduces the spirit of different parts of the varied country with which he deals is illustrated in a number of admirable passages, though none, perhaps, better than that describing of the gloomy features of Egdon Heath. He handles history, too, with a light, pleasing, and amusing touch, and his account of the vicissitudes of

Corfe Castle during the Civil War is attractive reading in the extreme. Mr. Harper is, of course, an admirer and lover of Mr. Hardy above all things, and the amount of erudition that he has brought to the illustration of the Hardy novels is remarkable. But he knows other writers well too, and his familiarity with those of the eighteenth century, particularly the ever fresh Horace Walpole, enables him to give an occasional touch of piquancy to his text, as witness his allusion to the dainty escapade of that historic and adventurous beauty, Miss Elizabeth Chudleigh, who, we are told, went to Ranelagh, in 1748, in the character of Iphigenia "but as naked as Andromeda." But why, oh! why, did Mr. Harper attribute one of the most celebrated passages in Tennyson's "Maud" to "Lady Clara Vere de Vere"? Doubtless a second edition will see this matter rectified. The work is excellently illustrated, and will unquestionably have a large sale amongst the wide circle of Mr. Hardy's admirers. Amongst these there are plenty of automobilists, and the book will form a delightful guide for those of them who desire to make themselves acquainted at first sight with the charms of the "Hardy Country."

Dicks' London Street Guide.

(London: John Dicks. 1d.)

THIS amazing little work is calculated to be of the very greatest service to all people living in London, more particularly to those whose business takes them largely to a variety of different addresses. The name of practically every street and their postal districts are given. In columns opposite to them are supplied the nearest main thoroughfare and the nearest railway station. It is a simple method, and enables even those who are unfamiliar with London to find their way about with the least amount of trouble.

PUBLICATIONS RECEIVED.

The Electrical Magazine. Vol. 3. No. 3. London: The Electrical Publishing Company. Monthly. 6d. net.

"*The Invention and Utility of the Pedrail*." By Bramah Joseph Diplock.

Beaumont Motor Club. Woodford, Essex: Souvenir programme of first opening meet.

Modern Iron Foundry Practice. Part II. By Geo. R. Bale, A.M.I.C.E. Manchester: The Technical Publishing Company, Limited. Price 3s. 6d. net.

Bacon's "Up-to-date" *Cyclists' and Motorists' Road-book of England and Wales*. London: G. W. Canon and Co., Limited. Price 6d. net.

The Little Guides. Cheshire. London: Methuen and Co. Price 2s. 6d. net.

Principauté de Monaco. Exposition et Concours de Canots Automobiles. Monaco: International Sporting Club.

Catalogues.

Swift Gold Medal Motor Cars, 1905. Coventry: The Swift Motor Company, Limited.

The "Ford" Car, 1905. The Central Motor Car Company, Limited, 117, Long Acre, W.C.

"*Cottereau*" *Automobiles, 1905*. Manchester: McNeil, Hutchinson and Co., Bury New Road.

Westrumite Patents, 1905 Improvements. Hope and Sons, 22, Billiter Street, London, E.C.

Laurin and Klement Motor-Fahrzeug-Fabrik. Jungbunzlau: Böhmern.

The Book of the Duryea Power Carriages for 1905. The Duryea Company, Limited, Coventry.

Bleriot Lamps and Horns. Weldhen and Bleriot, 54, Long Acre, W.C.

CORRESPONDENCE.

* * The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

ENCOURAGING BUSINESS!

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I am sure it will be of interest to some of your Colonial readers, if I relate the experiences of a lady automobilist from this Colony, with her first car.

She ordered the car whilst in England last year, from a well-known and much-advertised firm of car builders. She paid for it in full, and also for its packing on the 21st November last. The cost of the freight was left to be paid by a friend in the City.

The makers seemed much interested in doing what they could for her, gave her lessons on one of their cars, and she drove her car once before leaving England.

She left for Singapore on the 22nd November, and the car was (as she thought) to be sent by a "Glen" steamer leaving early in December. She duly arrived in Singapore, but for three months thereafter she heard nothing of the car! She finally telegraphed to a friend in England, and then learnt that the car had been shipped out on the "Glenesk." The bill of lading bore the date of the 9th January last. Observe the delay. She had paid for the car on the 21st November. Meanwhile not a line of any sort has she had from the makers, not even the promised letter of instructions.

The "Glenesk" arrived in Singapore on the 1st March, and Mrs. Dare asked me to drive up the car from the wharves, as she felt somewhat nervous at driving through the very crowded streets.

I accompanied her to the wharf to see the car unpacked, and a sorry sight met our eyes.

There was a large dent on the balk of the body—aluminium work—and the woodwork of the body, just at the entrance to the driver's seat, was smashed in (the packing had cost nine pounds).

Worse still, the car was positively in a filthy condition. Mud—good old English mud!—an inch thick on the whole of the under portion, the frame, axles, gear-box, &c., all were covered with it, and, of course, the mud-guards. Every bit of the machinery rusty, and the radiator was simply awful. This was discovered after the mud had been washed away.

To the writer the mud was interesting, as the first bit of old England he had seen for some years.

The tyres were deflated, not to be wondered at, perhaps, but what one did wonder at was to find a piece of English flint and a brass nail inside one cover, and, of course, a punctured tube. The back tyres were shockingly cut about, some of the cuts going right through the envelope.

The tyres are Clipper Continental, or were so when the car was purchased, but the near wheel now rejoices in a Dunlop inner tube. The pump sent with the car fits this tyre only, the other three tubes are of the Continental pattern, and have no pump!

Mrs. Dare paid for two spare batteries. They came, but the battery sold with the car had been removed.

A hood with side-curtains was also paid for. The hood was there, but did not fit the car, there were no side-curtains, and no screws or straps for attaching the hood to the car. It seemed to me that the hood had been made for a much larger car.

The outfit of spanners was incomplete, and there was no tyre outfit at all.

So much for this £225 worth of filthy iron-work and leather. Except for the painting on the body, the car looked like a dilapidated, second-hand one; in one or two places where I scraped a little of the paint off, I found dirt and rust beneath it.

You, sir, can imagine this lady's feelings. She had eagerly looked forward to the car's arrival—as we all do to the advent of our first car. She is the first lady-motorist in this part of the world, and is very keen on it, so you can imagine her disappointment and surprise at being so treated.

One can now quite understand Mr. Jarrott and others writing down English firms and their methods of doing business, as compared with those of Continental firms.

The only conclusion I could come to was that this lady's car, between the 22nd November and the 9th January, was used to take prospective customers out for trial runs and finally put into a case, unwiped and unwashed, to be shipped away 8,000 miles!

What other explanation can there be of punctured tyres, changed tubes, dirty spark-plugs and missing batteries?

Should the particular firm in question read this, they cannot fail to know that it is meant for them, and they may be pleased to know that they have lost, at least, one possible client through their discourtesy to this lady. I am, yours truly,

P. FOWLIE, M.B. & C.

Singapore, March 10th, 1905.

CYLINDER LUBRICATION ON MODERN CARS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I am glad to see that at least one of the large firms of English motor car manufacturers is alive to the fact that present-day practice of cylinder lubrication is not as satisfactory as it should be.

I think Mr. Edge is on the right track, and if he can put his cocks in a position that they are not likely to get carried away, or the muzzles filled up with dirt, and the handle for opening them in a convenient position, I think it will go some way to the solution of the problem "smoking."

Mr. Edge does not tell us if he uses separate feeds to all the cylinders as well as the crank-chambers, because even if your crank-chamber oil level is correct you can still smoke if your cylinder-feeds are running too fast, and with an exhaust-pressure lubricator it is no easy matter to keep the feed really constant.

However, with Mr. Edge's system, on the Napiers, it should be an easy matter to let out some oil if you find you are "smoking." I hope Messrs. Napiers will now look at the lubricator end of the problem.

Yours truly,
RICHARD BAYLY.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I was very interested indeed to read Mr. Bayly's remarks on the above subject, as it has always appeared to me that this most important point is one that has not up to the present received the serious attention by the constructors of motor cars that it ought to have done.

The requirements to carry out this in a proper manner, I think your readers will agree with me, are as follows:—

- (1) The supply of oil to the internal parts of the engine should be positive.
- (2) The supply of oil should be continuous and varied according to the engine speed.
- (3) An instant and visible means should be provided so that the driver of a car can always ascertain at a glance when travelling, that the proper lubrication is taking place.
- (4) That there should be some means of conveniently ascertaining the requisite quantity of oil in the engine.

In the "Brotherhood" system of lubrication to the engine, we think you will find that every one of these points are carried out.

In the first case, the oil is pumped absolutely directly into the interior of the engine, and the strength of these pumps has been carefully calculated out so that they can overcome any ordinary resistance that may be caused through the choking or furring up of the lubricating pipe, so that the oil supply is always positively assured.

In the second case, the pumps being driven direct from the engine itself, their speed of working varies with the engine speed, and consequently, the greater the speed of the engine, the greater the oil supply, and the lesser the speed of the engine, the less the oil supply.

Thirdly.—The working of the oil pumps is visible at a glance from the driver's seat, as a continuation of the pump spindles extend through the top of the lubricator, which is fixed on the dashboard, and, in consequence, the driver can observe whether these are working properly or not.

Fourthly.—The lubricator is so arranged that the thinning or thickening of the oil caused by difference in temperature does not affect the oil supply, so that whether the motor is working in hot or cold climates, the supply of the oil is regular, constant and positive.

Fifthly.—To ascertain that the correct quantity of oil is in the engine, level cocks are fitted at the requisite height in the crank-chambers of the "Brotherhood" petrol motors, so that by opening these it can immediately be ascertained if the correct quantity of oil or not is in the engine. If there is not a sufficient quantity, the oil pumps are so arranged that they can be worked independently of the running of the engine, by hand, so that the supply can be pumped up to the requisite amount.

From these details, Mr. Bayly will be able to ascertain that the only weak point that he suggested in the "Brotherhood" lubricating system, viz., the fifth point mentioned, is provided for.

Your correspondent, Mr. Bayly, will most probably be interested to hear that in carrying out the tests of the "Brotherhood" lubricator, the engine in the car was first of all emptied of all oil and washed through with paraffin, so as to assure their being none left, the requisite amount was then put into the base chambers, and the car was run over a distance of 500 miles, extending over a period of about ten days, just as it would have been used in ordinary use.

No further oil was added other than that supplied by the lubricator, and at the end of this period the oil was emptied out of the engine and carefully remeasured, with the result that only about half a teaspoonful less lubricating oil came out of the engine than was originally put in, and the loss of this small quantity can easily be accounted for by being distributed over the working surfaces of the interior of the engine.

So accurate and regular is the working of this lubricator, that it has caused a great amount of comment from those people who have seen the "Brotherhood" car running at various times, that the exhaust never has been noticed to emit the objectionable clouds of smoke that generally come from over lubrication, and considering that

the first "Brotherhood" car has now run a distance of over 8,000 miles, and there is no sign of undue wear whatever in any part of the engine, I think it proves that there is very little wrong with the lubricating system.

Moreover, it has the advantage of requiring little or no attention when the lubricator has once been set, other than filling up of the lubricator with oil when necessary.

Yours truly,
For Brotherhood-Crocker Motors Limited,
PERCY RICHARDSON,
General Manager.

April 14th, 1905.



A DENNIS MOTOR OMNIBUS.



A Double-Decked Dennis Petrol Omnibus, supplied to the London and Suburban Omnibus Company. The 'bus has seating capacity for 30 passengers.

THE double-decked 'bus—shown in our illustration—has just been supplied by Dennis Brothers to the London and Suburban Omnibus Company, and is to run between Surbiton and Kew Bridge. The seating capacity is for thirty passengers (16 outside and 14 inside). The chassis is fitted with a four-cylinder 20-h.p. engine and a gear-box of the sliding-spur-wheel type, giving three forward speeds and a reverse. The live axle is worm-driven—as on the Dennis touring cars—and on the top speed, which is a direct-through drive, the lay-shaft in the gear-box is idle. A spring-drive is introduced, and the axle casing is also connected with the frame by a spring-suspended torque-rod. The driving wheels run on tubular extensions of the axle casing, and the axle casing itself is carried in horn

plates which are fixed to the side members of the frame.

The engine has its four cylinders cast separately, the bore and stroke are 4 ins. and 5½ ins. respectively. The engine is governed on the throttle, and is fitted with a Dennis automatic carburettor. The clutch is of the ordinary cone type and is easily dismantled by disconnecting a coupling between it and the gear-box. The usual brakes are provided, a band-brake, operated by foot, is fitted behind the gear-box, and internal-expanding brakes, operated by hand, are mounted on the hubs of the rear wheels.

All the wheels are of the double artillery pattern, and the driving-wheels are shod with 34-in. by 3½-in. twin tyres. The total weight of the vehicle is 2 tons 18 cwt.



SOME of the new lines of motor 'buses run along Nottingham Place, W., a district much frequented by doctors, professional men and nursing institutions, who have joined hands and risen to protest against the invasion—what is described as the "purr" of the motors being strongly objected to by many of the inhabitants. We conclude from this movement that Nottingham Place has made

an end of hurdy-gurdies, street hawkers, and particularly the leather-lunged exponents of the Metropolitan coal trade. In fact, we may be sure of it, as otherwise the "purr" of the motors would certainly be inaudible. Such being the case, it is indeed a pity that this *rus in urbe* should be invaded by modern locomotion, even though the motor 'buses may actually bring the doctors some of their patients.

CARBURETTORS.*

By Mervyn O'Gorman.

1. What do We Want from the Carburettor?—We know that from the same engine we want different results according to circumstances and times.

- (1) Sometimes the most power at the highest speeds, *e.g.*, when racing and on dead level runs.
- (2) Sometimes the most torque at slow speeds, *e.g.*, starting, picking up in traffic.
- (3) Sometimes the most speed at various torques, *e.g.*, hill climbing in open country.
- (4) Sometimes the minimum speed at no available torque, *e.g.*, engine crawling round when car is standing.
- (5) Sometimes (as in commercial vehicles) the utmost fuel efficiency at various rates of working, *e.g.*, getting home when short of fuel.

Quantity.—The carburettor which is to meet these engine requirements must evidently be prepared to supply different quantities of mixture for these results. Although we may know for any one particular car the angle of inclination of the throttle lever advisable, this has little relation to the amount of gas used. As far as I am aware no one has yet published the results, and I rather think no one has ever yet got any results worth publishing which give the measured volume at various speeds and positions of throttle-valve in respect of any one of the types of car engines in use. This is a matter for regret, not felt by the user of the car perhaps, but great concern to the designer of a carburettor.

I am fortunately in a position to give you one result under this head—a result for which I am indebted, as in certain other matters which I shall mention—to my friend, Mr. G. H. Baillie. He has found that a standard 4½-h.p. De Dion engine, even with very clear large and open inlet and exhaust pipes, will only draw at a top speed of 1,500 revolutions, 50 per cent. of the volume swept by the piston. That is to say, the volume that might be taken in is 13.4 cubic feet, or about one pound of air per minute of suction time, and the volume that it is taken in is 6.7 cubic feet, or about half a pound per minute. It is easy to see how this bears on the carburettor design, as simultaneously with the diminution of air coming in per stroke we have a considerable increase of vacuum, and of suction on the petrol. What the volumes are at all the intermediate speeds is exactly one of those researches which must be publicly undertaken soon on some typical engine.

Quality.—Looking for grains of information as to the best quality of mixture for the various conditions named, we find a similar chaos of disordered knowledge. Makers have begun to recognise that the desirable mixture is not of constant quality (1 in 15 or 1 in 16 as is still occasionally asserted), but should vary according to the quantity taken, the speed of engine and the power

thirty samples will give definitely what weight of burnt and unburnt petrol was indicated in each pound of exhaust gas. If simultaneously a very small air-pump on the induction-pipe (drawing at the same time as the engine draws its charge) was to collect samples of incoming mixture, we could also find directly what weight of petrol was being taken into each pound of air. I have not heard that this kind of test has yet been done, but the so-called "automatic" carburettor indicate that the public mind is enquiring for some such results. In fact, before accepting a carburettor, we ought to have some means of checking the maker's assertion that it gives automatically a correct mixture.

Why "Automatic" Carburettors?—Reason I. The automatic "extra air" valve was introduced to give to the engine at high speed a diminished quantity of petrol per stroke. This fact is often stated differently, namely, that it was introduced to give more air at high speeds than at low speeds, but this is the wrong way to put it. More air is available, but it is not taken, for from 40 per cent. to 25 per cent. less air per stroke is taken in at high speeds with any (or without any) automatic valve (at say 1,500 revs.) than at low speeds (say 150 revs. per min.). This is the chief reason why less petrol per stroke is wanted if we wish to maintain what may for the present be called the normal proportions of mixture (say one part by weight of petrol vapour to fifteen parts of air). We cannot hope to cure this by making smoother and larger air passages and valves. Since the chief difficulty is not the friction of the air but the inertia and elasticity of the air which prevents our giving it the necessary acceleration in the short time available to get it in.

Reason II.—Besides this chief reason, there are subsidiary reasons why less than the normal flow of petrol per stroke is wanted at the highest engine speeds. Thus, although the volume sucked in is about one-third less, the compression is effected ten times faster, and this means a hotter compression, and therefore a higher compression, than if the same amount of gas were compressed in the same engine more slowly. In the two extreme cases of speed, namely infinitely slow and infinitely fast, the difference of pressure is enormous. (Figs. 1 and 2.) In an engine of which the ratio of compression is 3.63 to 1, only 42 lbs. compression is obtained in the one case and 89 lbs. in the other, taking a supposed full charge of air in each case. Fig. 3 indicates the effect when mixture is used instead of air.

If the engine of my example had the usual five to one compression ratio, this would mean bad pre-ignition with a normal mixture, and a poorer mixture automatically given would be necessary to save the situation at high speeds, unless we submit to the inefficient process of diminishing the compression by strangling the volume of incoming gas. (At present we do submit, and at full speeds we usually work at half throttle without knowing it.)

The result of Figs. 2 and 3 arises from the lessened loss of heat to the cylinder walls during compression. Infinite speed is not approached, of course, but the range of speeds in practice is very

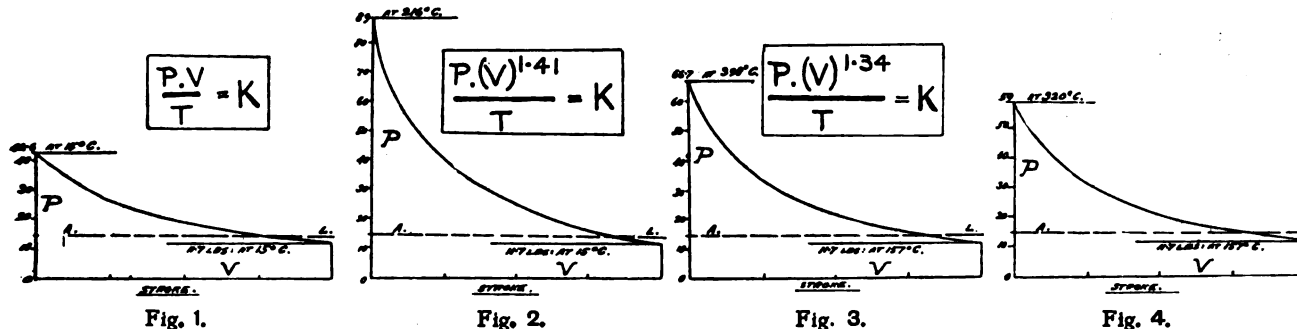


Fig. 1. Fig. 2. Fig. 3. Fig. 4.

Curves showing the Increase in Pressure during the Compression Stroke of an Internal Combustion Engine.

Fig. 1.—When the temperature of the gas (air, petrol, and burnt gases) remains constant.

Fig. 2.—When the temperature of the gas (air) retains all the heat of compression.

Fig. 3.—Conditions as in Fig. 2, but gas consisting of air, petrol, and burnt gases.

Fig. 4.—Curve plotted from experiments made by G. H. Baillie.

required at that speed. It is clearly possible with a given carburettor and engine to delicately adjust the mixture for a whole series of conditions, and then collect samples of the exhaust gas and analyse each sample by condensing it in the usual way with liquid air and so estimate the quality of the mixture used.

Thus we could take ten 1-mile sprints with everything in good trim, and vary nothing but the mixture. Our experimenter would adjust mixture for the first half-mile, open the tap from the exhaust by-pass to the sample collecting cylinder during the middle section of the second half-mile. This would give an average analysis for high-speed conditions. Similarly an average analysis would be got from hill-climbing tests. Similarly again, for that mixture which best enables the engine to merely keep itself rotating slowly. These

great, and we must not forget the diminution or all small leakages of gas past the piston rings and valves, spark-plug, inspection-cock, plugs, and joints when the stroke is rapid, all making for an increased compression, and therefore, from a carburettor point of view, all pointing to the desirability of a poorer mixture.

Reason III.—The high and hot compression is further enhanced by the incomplete discharge and high temperature of the exhaust from the previous stroke, and the consequent greater temperature of the fresh gas when mixed with undischarged residue.

Mr. G. H. Baillie, who has calculated the initial temperature at the beginning of the compression stroke of an experimental engine in his laboratory, gives it as 157 degrees at the beginning, and 320 degrees C. at the end of the compression stroke at a normal speed which we may take as 1,000 revs. per min. I give his curve of pressure (Fig. 4).

* Excerpt of a paper read before the Automobile and Cycle Engineers' Institute, on Thursday, the 13th April.

Reason IV.—A reason for requiring at low speeds more petrol per stroke is based on a totally different consideration. At the limit of slowness with a normal mixture, we fail, even with a retarded ignition, to keep the engine rotating (because of the evanescent character of the explosion pressure and the failure to ignite, or, at least, the incomplete ignition of the charge which, you will remember, is much throttled down, and, therefore, poorly compressed). But we find by experiment that a slightly more durable explosion pressure is secured and much more certain ignition is obtained when the mixture is rich in petrol. We do not get complete combustion of the petrol, and we take the risk of a little smell for the sake of a "flexible engine." This engine question has therefore become a carburettor question.

Similarly with other methods of enabling our engines to continue

doggedly to do a modicum of work at slower speeds, namely, increasing the relative size of the compression volume, increasing the number of cylinders, and using mechanical inlet-valves, all of which bear directly upon carburettor design, because they affect the rate at which gas is called for, and the manner and frequency of that call. In fact, although an engine and a carburettor are made and sold as independent purchasable commodities, an engine will not travel its best if its carburettor does not fit.

In view of all this, it is small wonder that definite action has been taken, even without laboratory experiments, to vary the quality of the mixture in some manner remotely according to the conditions of its employment.

(To be continued.)



CLUBS AND ASSOCIATIONS.

Derby A.C.—The annual dinner of this club took place on Friday, April 7th, at St. James's Hotel, Derby. About fifty members and friends attended, and in the absence of the president, Mr. W. G. A. Strutt, the Chair was occupied by Mr. Francis Bolton, J.P. Among those present were:—The Mayor of Derby (Councillor W. Hart, J.P.), Sir Clement Bowring, J.P., Mr. J. A. Arnold, J.P., Major Phelps, Drs. Copestake, Wilson, St. John, Arundel, and Turton (Heanor), Messrs. Rees Jeffreys (secretary of the Motor Union), G. F. Reading (Challenge Cup holder), C. J. Allin (secretary of the Derby A.C.), R. S. Clifford, R. W. Sale, C. Turner Leech, E. J. Hulse, J. V. Porter, C. A. Newton, H. Dawson, F. G. Smith, Booth Grainger (secretary of the Notts A.C.), M. P. Mell, Orchard, F. Reading, H. Reading, Sydney R. Turner, P. Lane, C. Smith, S. Attwood, Aspdin, A. R. Robotham, G. B. Fletcher.

On the Saturday following a club run to Ashby-de-la-Zouch took place, the Derby A.C. members joining those of the Notts, Leicester, and Wolverhampton clubs at this old-world town.

Leicestershire A.C.—Members indulged in a very pleasant drive to Ashby-de-la-Zouch for their first run of the season last week. At the Royal Hotel, the Leicester Club joined in with representatives from the Nottinghamshire, Derbyshire and Wolverhampton Clubs, a gathering of about one hundred cars being the result.

Maldstone Motor Club.—The opening run of the Club took place last week to Charing, and amongst other events contemplated for the season are:—Easter Monday, run to Dymchurch and Charing; May 6th, a reliability run for motor cycles *via* Ightham and Tonbridge; May 20th, reliability run for cars over the same route; June 3rd, a second reliability run for cycles *via* Ashford, Canterbury and Charing; June 17th, a second reliability run for cars over the same route; July 1st, third reliability run for cycles *via* Pembury and Hawkhurst; June 15th, car reliability run over the same route; and in August a petrol consumption trial, and in September a hill climb.

Society of Automobile Mechanic Drivers.—At a meeting of the above society, held at their headquarters, 51, Brick Street, W., last week, it was proposed that, as the society progressed, branches should be formed in the provinces, but that at present country members should be admitted on a written guarantee, as to their capabilities, from their employers.

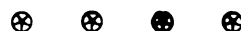
The chairman (Mr. Groves) stated that the society was formed under the Friendly Societies Act as a mutual benefit society, and he expressed a hope that employers and manufacturers would see their way to strengthen the society by becoming honorary members.

Southern Motor Club.—The 1905 handbook of the club just to hand, in addition to giving lists of members and useful information to motorists, foreshadows a very busy season during the present year. Besides the week-end fixtures, a series of other events are down in the list, making up a very varied programme, including long-distance trials, hill climbs, holiday tours, and a number of picnics.

The inaugural run of the Southern Motor Club took place on Saturday to Ewell, and was favoured with perfect spring weather. The start took place at 2.30 from headquarters, the Canterbury Hotel, Brixton, amid great excitement, this latter being occasioned by the presence in the procession of cars, quads, and motor cycles of a gigantic 24-h.p. Durkopp

motor char-a-banc, in which were seated, to the number of thirty, those lady friends of the members for whom it had been impossible to find accommodation in the cars. The passage of the huge vehicle, with its fair freight, up Brixton Hill frequently aroused bursts of admiring applause from the foot passengers, especially when the vehicle passed with ease one of the electric tram cars. The journey to the rendezvous at Ewell, the Glyn Arms, was accomplished in good time, and after a much needed tea had been partaken of, the various vehicles "lined up" in front of the hotel, where they were photographed. It was then seen that the number of vehicles was the largest ever seen at one of the club's gatherings, and that the members and their friends numbered between seventy and eighty. Amongst those present were Mr. F. C. Pattison (11-h.p. Clement), Mr. Aloof (14-h.p. Minerva), Miss Pattison (5-h.p. Humberette), Mr. H. J. Gutteridge, Mr. W. Acton, Mr. A. Weston, Mr. J. H. R. Lloyd, Mr. H. Billing, Mr. C. B. Ward, Mr. A. Vickers, Mr. C. R. Schlimper, Mr. W. S. Groom, Mr. F. G. Cooper, Mr. C. H. Pugh, Mr. W. May, Mr. H. E. Dyson, Mr. T. J. Alexander, Mr. J. O. Aikman, with the hon. sec., Mr. W. L. Lorkin, and many others. A very pleasant impromptu concert took place, under the chairmanship of Mr. Allen Vickers.

Yorkshire A.C.—The opening run of the season has been fixed for April 29th to Windermere, where the headquarters will be the Grand Hotel, Bowness. The occasion has been selected in consequence of an invitation from Mr. H. R. Kirk to the members and friends of the club to dine with him at Bowness on the evening of the 29th, and on the next day, Sunday, join in a cruise on Windermere Lake.



MOTOR CYCLING.

Motor Cycling Club.—For the London to Edinburgh run, the starting point will be the G.P.O., as last year, and the finish at the Edinburgh G.P.O. Provision will be made for discouraging speed beyond the legal limit. All who complete the distance in the twenty-four hours will be placed on an equality, and nothing will be gained by finishing earlier.

For the Easter tour, members will meet at the Chequers, Uxbridge, 10 a.m., Friday, April 21st. Lunch at Golden Cross Hotel, Oxford, 1.30. Thence *via* Witney and Northleach to Cheltenham (Plough Hotel). Saturday's route will be Tewkesbury and Ledbury. Lunch at Mitre Hotel, Hereford, returning *via* Ross, Symond's Yat, and Gloucester to Cheltenham. Sunday's route will be to Chepstow *via* Gloucester and Newham, returning after lunch *via* Tintern Abbey and Monmouth to Cheltenham. The return to London will be made on Easter Monday.

THE Auto-Cycle Club of France "tour of France," originally fixed to commence on May 4th, has been postponed to take place from May 13th to 21st.

THE interest taken by the Cyclists' Touring Club in the elimination of side-slip has taken the practical form of devoting £400 to the purpose of discovering a remedy. Nearly sixty entries for the competition which has been organised have been registered. The first trials will probably take place in the neighbourhood of London during Whit-week upon both natural and prepared surfaces.



During the automobile tour of Queen Margherita of Italy, she was everywhere greeted with an enthusiastic reception. The above photograph, which is an incident on her Rome to Turin tour, is a fair illustration of the popularity of the Queen.

Motor Engines as Applied to Fishing-Boats.—

At the instance of the Secretary for Scotland, Lieut. Mansfield Cumming, R.N., has been going very thoroughly into the question of the applicability of internal combustion motors as providing auxiliary power for use on fishing boats. Lieut. Cumming, in the execution of this commission, first of all visited Scotland, and carefully examined the fishing-boats in use there, and then proceeded to a variety of German and Scandinavian ports to examine the types of engines in use for similar purposes. Very naturally Lieut. Cumming places considerable stress on the importance for the work in question of absolute safety from fire. Bearing this in mind, he is strongly of opinion that, though alcohol and petrol motors may be rendered absolutely safe in the future, it is at present advisable only to employ for propulsion of fishing-boats motors using heavier oils of the nature of Royal Daylight, Tea Rose, or similar brands. In general, he considers that motors of not less than 20-h.p. should be employed on ordinary-sized fishing-boats, the cost involved by the different makes which he has ex-

amined, and regards as reliable, amounting to from £300 to £320. The cost of altering the boat for its reception would vary from £50 to £80. Lieut. Cumming is not favourably impressed by the efficiency of any of the existing types of reversing gear, and considers that of two evils the reversible propeller is the least.



Queen Margherita of Italy in motoring costume.

SOME little time ago the carriage of Mr. Pierpont Morgan, when driving in the Bowery district of New York, struck and knocked down a woman, causing her painful injury. The coachman did not stop, but whipped up his horses and made off, followed by a howling mob, headed by the police, who ultimately pursued the absconding hippomobile in a parcels van, which they commandeered for the purpose. The result—not complimentary to Mr. Pierpont Morgan's cattle—was that the carriage was overtaken and the coachman arrested, Mr. Morgan and Mrs. Morgan, cabbing it to their destination, their wealth doubtless saving them from arrest. Such callous behaviour is, fortunately, becoming practically unknown amongst drivers and owners of motor cars.

RACES, RECORDS, AND TRIALS.

Gordon Bennett Race.—As announced last week, the date for the British Eliminating Trials in the Isle of Man has been postponed for one week to May 30th, and the inspection of the cars, therefore, will take place on Monday, May 29th, instead of May 22nd.

The special *fltes* which are being organised by the Auvergne A.C. have now been practically determined upon. June 18th is to be devoted to mile and kilometre speed races; June 22nd, an automobile *Corso Fleuri* from Royat to Clermont will take place; June 25th, a tourist car contest; June 29th, a hill-climbing test for the Coupe d'Auvergne; and on July 2nd, an automobile gymkhana, appearance competition, &c.

Hindhead Hill Climb.—On Saturday last the West Surrey A.C. held a hill-climbing competition at Hindhead, the measured portion being 2 miles 1,500 yards, with an average gradient of 1 in 20. The contest was a handicap, the results being as follows:—1. Sir A. Conan Doyle, 10-h.p. Wolseley, 9 mins. 56 secs. (time allowance, 4 mins. 46 secs.); 2. M. A. Tessier's 10-h.p. Motobloc, 10 mins. 21½ secs. (allowance, 4 mins. 30 secs.); 3. M. Leon's 14-h.p. Renault, 8 mins. 39½ secs. (allowance, 2 mins. 39 secs.).

Nice Automobile Week.—In magnificent weather the commencement of this annual fixture took place on the 14th instant, when the first portion of a tourist car competition was run off. This event was not one of speed, but of regularity only, over a distance of only 75 kiloms., starting from Nice and returning thereto, the original distance of 153 kiloms. having been abandoned. A maximum time of 3 hrs. 21 mins. was allowed in which to finish, and on the Turbie Road the time on the hill over half a kilometre from a standing start was taken. The best time on this hill was made by a 60-h.p. Mercedes of 1 min. 15½ secs. The following day the contest was concluded by holding different tests for brakes, turning, silence, and absence of dust-raising. These took place on the Promenade des Anglais at Nice, points being awarded by the judge under each head. The final results were as follows:—1. 24-h.p. Berliet, 521 points; 2. 18-h.p. Peugeot, 518 points; 3. 12-h.p. De Dion, 494 points; 4. 10-h.p. Renault, 486 points; 5. 35-h.p. Bayard Clement, 483 points; 6. 60-h.p. Mercedes, 470 points.

Coupe Provinciale.—The inter-club competition of the South-East Federation of French clubs took place on the 13th inst., the route being from Nice to Cap Martin. The victory and, therefore, the custody of the trophy fell to the A.C. of Marseilles, who secured the win with a team composed of a 40-h.p. Turcat Méry, a 40-h.p. De Dietrich, and a 20-h.p. Berliet. For the "Coupe du Sud-Est" the Marseilles Club were winners with two 10-h.p. De Dion Bouton cars and a 16-h.p. Turgan. For motor bicycles the Moto Club of Marseilles were victors with a 4-h.p. Buchet, a 3-h.p. Buchet, and a ½-litre Buchet. Included in the trial was a speed test over the kilometre on the flat, standing start, on the Nice Promenade des Anglais. The best times over this were made by the 20-h.p. Berliet, 59 secs.; 30-h.p. Turcat Méry, 59½ secs.; and 4-h.p. De Dietrich, 59¾ secs. Times were also taken on the road leading up to the

Braus Pass. The total distance of the run was 147 kiloms., and the best time was made by Rougier on the Turcat Méry, his time being 3 hrs. 30 mins.

Forezien A.C. Tourist Trial.—The results of the contest organised by this club at St. Etienne, resulted in the first place being secured by a 22-h.p. Berliet car, thereby bringing this make of car into remarkable prominence, owing to the succession of wins which it has made within the last few weeks. This comparatively unknown make of car has secured, as we record, the Marseilles Hill-Climbing Contest; was one of the best running cars in the winning team of the Coupe Provinciale, making the highest speed in the kilometre test, whilst another first place secured by the same car is in the Tourist Competition in connection with the Nice Automobile Meeting. The Forezien event was over a distance of 213 kiloms., with special timing over several important hills. Twenty-four cars entered into competition with, as already stated, the result that the 22-h.p. Berliet came out at the top with 1,345 points; (2) 24-h.p. Peugeot, 1,315 points; (3) 20-h.p. Pilain, 1,270 points.

International Contest for Commercial Vehicles.—The competition being organised by the A.C. de France, originally announced to take place in May, it is now officially notified will commence on July 28th and finish up on August 8th next. We gave the main particulars governing these important trials some time ago, and from these it will be remembered that seven daily journeys will be made, starting from Paris, to a number of leading cities, at certain of which an exhibition of the competing vehicles will be held. These latter take place at Amiens, Dieppe, Havre, and Rouen.

Tourist Trophy Race.—Entries have now reached 51; the additions since last week being Mr. Lewin (Peugeot), Mr. G. V. Baxendale (Thornycroft), Mr. E. Lewis (Rover), and Mr. J. K. Starley (Rover).

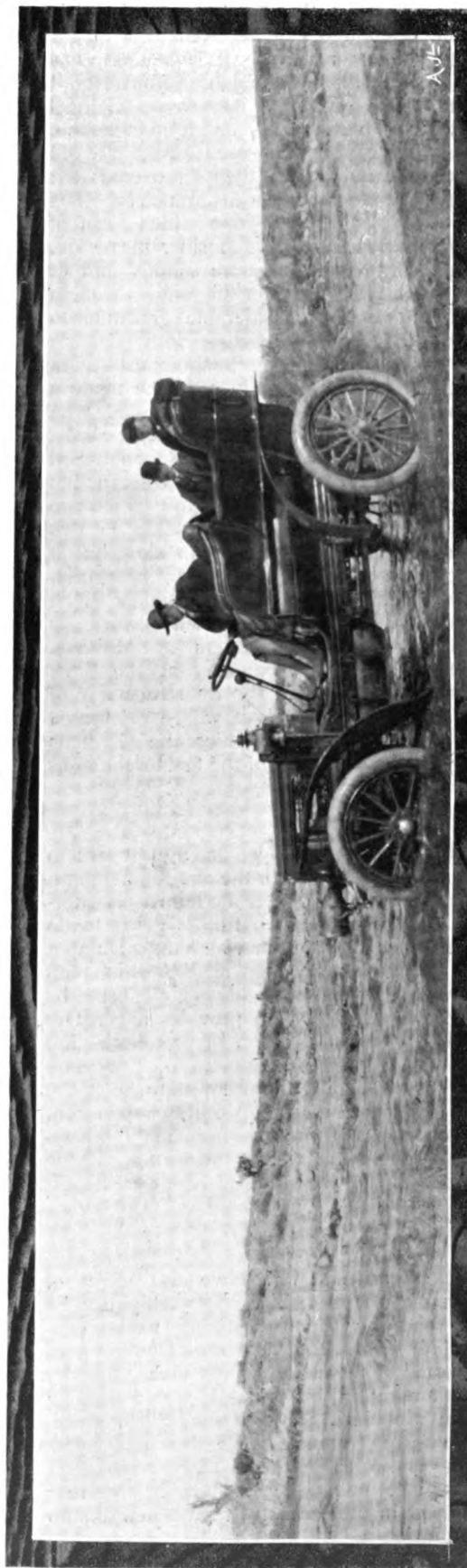
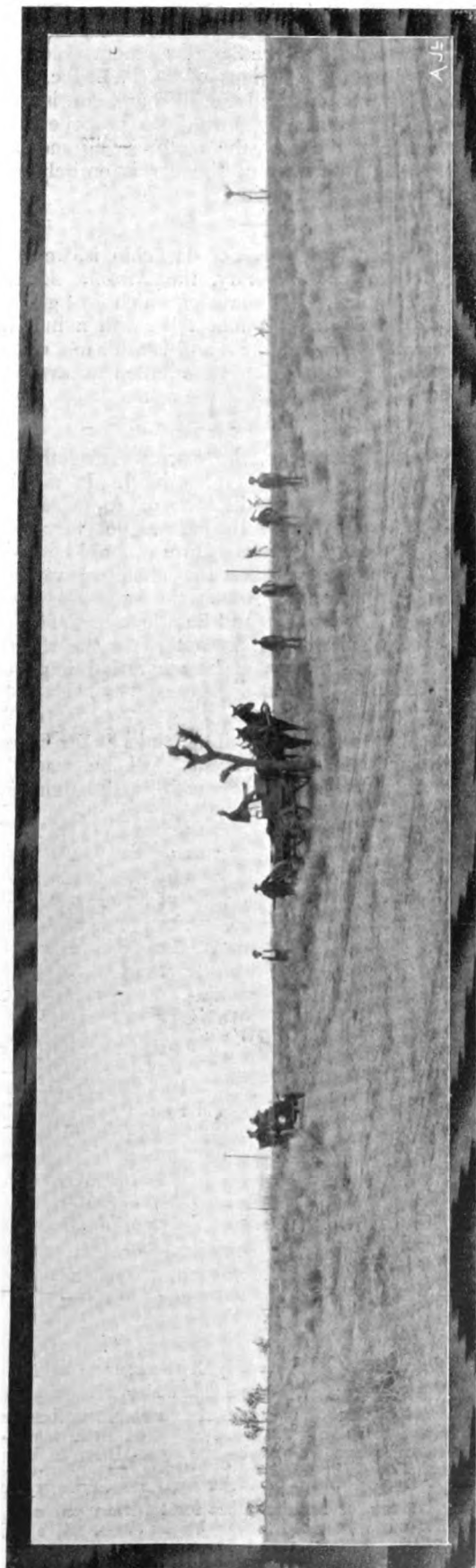
Vanderbilt Cup.—Five Fiat cars have been entered to represent Italy in this race.



MOTOR BOATING.

A New Marine Motor Club.—The Marine Motor Committee of the Automobile Club have recommended, and the club committee have adopted their recommendation, to form immediately a club for marine motoring which will take up energetically the sport of marine motor racing and deal with that side of automobile sport in similar manner to the Auto Cycle Club with motor cycling.

AGAIN the finishing point for the Motor Boat Race from Calais to England has been changed. Originally it was hoped to have the boats race far up the Thames, but by degrees the finishing point had to be brought down lower and lower, until ultimately Ramsgate was decided upon. Following agitation in certain quarters in France, the A.C. de France have now determined to make this cross-Channel race taking place in July, finish at Dover, the same as last year.



White cars are no novices at finding their way into the most remote and inaccessible places. The middle of the Mojave Desert, in Southern California, which the top of our two illustrations depicts, is probably the most desolate region ever invaded by an automobile. A White car was, however, requisitioned for the purpose of inspecting the telephone wires running over the desert, and is here shown assisting on this service. Unbridged streams, too, are often enough met with in out-of-the-way parts of the States of this character, and in the lower view the White car is seen negotiating one of them.

AERONAUTICS.

It is with extreme regret that we have to chronicle the death of the celebrated Colonel Renard, who, for some years past, as our readers will remember, has been in charge of the Military School of Aeronautics at Chalais-Meudon. One evening, last week, Colonel Renard sat down to take a short rest and a quiet smoke. That was the last time that he was seen alive. He did not turn up to dinner, and it was then discovered that he had passed away while seated in his arm-chair. His death was due to a heart attack, from which form of malady he had been suffering for some considerable period. Happily nothing could have been more sudden and at the same time more painless than his end. Modern aeronautics owe a debt of considerable gratitude to Colonel Renard. He, in conjunction with Captain Krebs, was the first to demonstrate the practicability of a modern navigable balloon, and in 1888 he made a successful flight over Paris with the celebrated "La France"—an airship of the now familiar cigar-shape type, with a rear propeller driven by an electric motor supplied with current from a particularly ingenious construction of bichromate battery devised for the purpose by the two aeronauts. Of course, the power obtainable in this way was small, and the speed of the airship slow, but it was sufficient to make her answer her helm satisfactorily, and it demonstrated the workability of principles which have subsequently been carried so much further by Santos Dumont and the experimenters at Moisson. Col. Renard, though only a lieutenant at the time, served with some distinction in the disastrous war of 1870, and he was among the garrison whose celebrated defence of Belfort (the one town which the Germans could not take) shone out as one of the few bright spots in the campaign.

M. SANTOS DUMONT is going, we had almost said to sea, but we ought really to say into the air, for a month—some day. At any rate, in one of the numerous interviews in which he has described what he is going to do in the more or less approximate future, M. Santos Dumont maintains that he has invented an airship which can remain aloft for any required time, this being effected by a compensating arrangement which provides a constant supply of hot air by the combustion of petrol, the hot air being introduced into a ballonet of the same general type as has hitherto been employed to keep the gas vessel taut by having air pumped into it by a fan. The gas vessel of the new Santos Dumont airship, therefore, may be looked upon as a combination of the hydrogen balloon with the old Mongolfier hot-air balloon.

It is probable that this will have the effect of enabling the length of time which the airship can be maintained in the air without re-gassing, to be considerably extended. But when M. Santos Dumont goes on to talk, as some of the daily papers make him do, about having an airship on this principle with a sleeping compartment, in which M. Santos Dumont will gracefully refresh out-worn nature while his passengers manage the valves so as to keep the airship aloft (though not running), one is tempted to believe that not all the gas used in connection with the new airship will be confined inside it.

THE well-known bicycle track rider of Paris, M. Jacquelin intends to attempt extending his triumphs into the regions of the upper atmosphere. At any rate, he is having an airship of the Santos Dumont type built for him according to the designs of M. F. Leduc. The hull of the airship is practically finished and consists of a framework of the ordinary type with two propellers, one in front and one at the rear, the motor being mounted amidships. The framework of the car is entirely constructed of polished steel tubing.

THE airship of Count Almerico da Schio is, we learn from our Italian contemporary, the *Rivista Mensile*, approaching completion. The vessel, which is of graceful shape, is of the Santos Dumont type, with a hull, the lower surface of which is curved, and is said, to a certain extent flexible. The propeller is mounted at the front end of the car and the rudder at the rear.

CAPT. BALDWIN's airship, the "Arrow," recently had another triumph, at any rate of a kind. It raced a 24-h.p. Pope Toledo car a distance of 10 miles, and beat it. The performance of the car was not very good, however, as it took 7 minutes before it could be got in motion. That of course gave the airship a valuable start. The points between which the singular contest took place were Los Angeles and Pasadena in California. As however the airship did not return to the starting point, the demonstration is at best a rather imperfect one.

THE Aero Club have arranged meetings at the Crystal Palace, at each of which ascents will be made at 2.30 p.m., on April 29th, May 18th, 27th, June 3rd, 17th, 29th, and July 8th, 20th.



A POCKET VOLTMETER.—Among the accessories comprised in a motorist's outfit, the portable voltmeter ranks second to none in importance. The little instrument shown above is one of the specialties of Van Raden and Co. The dial is only calibrated from 3.6 to 4.2 volts, which represents the useful range of an ordinary battery of accumulators for ignition purposes, so that the motorist need never be in doubt as to the exact state of his cells.



The Cup presented by Mr. H. Kennet, Junr., to be awarded in the 100 miles passenger trials of the Motor Cycling Club taking place on June 24th.

Alcohol.—The departmental committee appointed to enquire into what means should be adopted to facilitate the employment of alcohol for industrial purposes, have formulated the following recommendations:—

That an allowance be granted to all industrial spirit, whether British or foreign, at the rate allowed to British plain spirits on export. This at present is 3d. per proof gallon.

That "ordinary" methylated spirit shall contain only 5 per cent., instead of 10 per cent., of wood naphtha.

That no charge should be made for the attendance of Excise officers to supervise denaturing operations.

That the regulations governing the sale by retail should be less stringent.

It will be observed that these suggestions are couched in a very liberal spirit, and will go a long way, if adopted in a Government measure, to relieve the manufactures which depend on alcohol from the disadvantages under which they have hitherto laboured in comparison with their Continental competitors. The effect of the proposed alteration will also to some extent improve the constitution of the alcohol as a fuel. Considering the great advantage which the German agricultural industry has derived from supplying home-made alcohol for motor car purposes, it is most sincerely to be hoped that the Government will adopt the suggestions of their committee, and if possible couple them with further measures which may give rise to the extension of the British alcohol industry. As the Chancellor of the Exchequer has expressed the hope that he will be able to adopt a large number of the committee's recommendations, both motorists and agriculturalists may look forward to some measure of relief in this important matter.

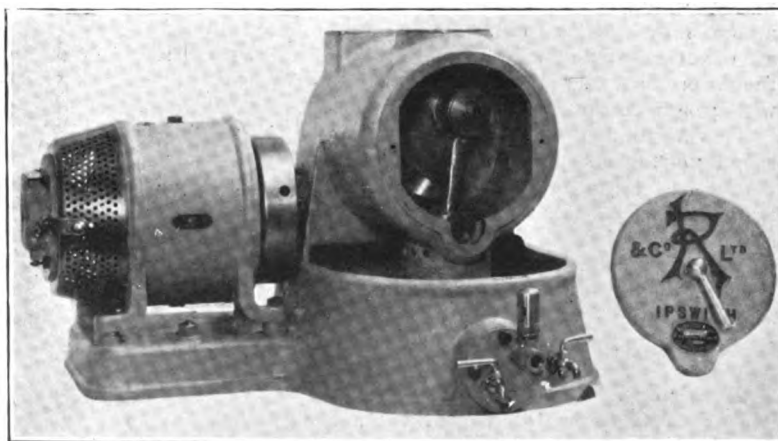
SIR THOMAS LIPTON, who has recently been in Ceylon, combining business with a delightful holiday, travelled mainly by means of a motor car, covering 625 miles comfortably in ten days.

BETWEEN Newcastle-under-Lyme and Trentham, a service of motor omnibuses is to be started by the Potteries Electric Traction Company.

MR. S. H. JEVES, who for many years was associated with the editorial department of the *Standard*, has been appointed editor of the *Automobile Club Journal*.

THE Bournemouth Town Council have been petitioned to provide a motor omnibus service along the sea road to the Boscombe Pier during the summer months.

It is one of the pleasing signs of the times to discover in the last number of the *Journal of the Society of Arts* a well-considered article on the subject of motor vehicles. It is largely a historical summary, and from it the curious may learn something of the way in which the old steam cars were driven off the roads by prejudice and Parliamentary legislation. It is a wonderful story and can really hardly be told too often. The determined opposition displayed by this country in the past (the spirit still largely survives) towards locomotory progress, wants rubbing in well and often. How such legislation could have originated anywhere but in Bedlam or Colney Hatch is a psychological mystery. No wonder the British automobile industry has leeway to make up. It is satisfactory to find the article to which we refer most hopeful on the subject of motor 'bus transport, and it looks forward, as most people who have taken the trouble to consider the situation without financial or political prejudice do, to a complete revolution in city traffic by this means. Justice, too, is done to the enterprise of the railway companies who are adopting the motor vehicle as feeders to their systems, and the enterprise in the same direction shown by the Post Office comes in for well-deserved appreciation. Of interest to readers of THE AUTOMOTOR JOURNAL are the statistics furnished in regard to canal traction by means of internal combustion motors running on the towpath, which has proved its value on one of the Belgian canals, and which we have always insisted is the best method of solving the problem, and in every way superior to electric traction.



A GARAGE COMPRESSOR.—A useful machine for the purpose of supplying compressed air for inflating tyres, has been brought out by the well-known engineering firm of Reavell and Co. The device, of which we give an illustration, consists of an electric motor which drives, through worm gearing, a single cylinder compressor. The trough surrounding the compressor cylinder is for retaining the cooling water. The capacity of the plant is 4 cubic feet of free air per minute, and the compressor can work up to 90 lbs. per sq. in. The size of the electric motor is $\frac{1}{2}$ -h.p. and the whole plant can, if required, be mounted on a small trolley.



AN IMPROVEMENT IN ENCLOSED TOURING CARS.—In order to give the occupants of the coupé a fuller view of the road an additional side window has been introduced into this vehicle in addition to that over the door. This addition is a considerable improvement as it enables those sitting in the back seat to look out on to the road without leaning forward. The car illustrated above has a 24-h.p. Napier engine and has been supplied by S. F. Edge, Ltd., to the order of Mr. Fairfax Rhodes.

A Four-Seated Electric Landaulet.—A new design of electric carriage—shown in our illustration—has just been introduced by the City and Suburban Carriage Company. Seating capacity for four persons is provided, and the wheel-base is of considerable length to give very easy travelling. The angle-iron frame is hung as low as possible, and is carried on semi-elliptic side springs, those at the rear being of somewhat unusual shape, and lying outside the frame.

The battery consists of 48 cells, half of which are carried under the rear seat and half under the driver's seat. The standard battery supplied with these vehicles has an output of 120 ampère-hours, which is stated to be sufficient for 35 to 40 miles running over fair roads.

The rear wheels are independently driven, through internal spur gearing running in an oil bath, by electric motors which are supported about the rear axle and attached by springs to the main frame. The motors are of the four-pole enclosed type and are series wound; their normal power being developed with 40 ampères at 80 volts.

The controller provides three forward speeds; on the first speed, the two halves of the batteries are in parallel and the two motors in series; on the second speed, the batteries are both in series as are, also, the motors; and on the top speed, which is equivalent to about 14-m.p.h., the batteries are still in series but the motors are in parallel.

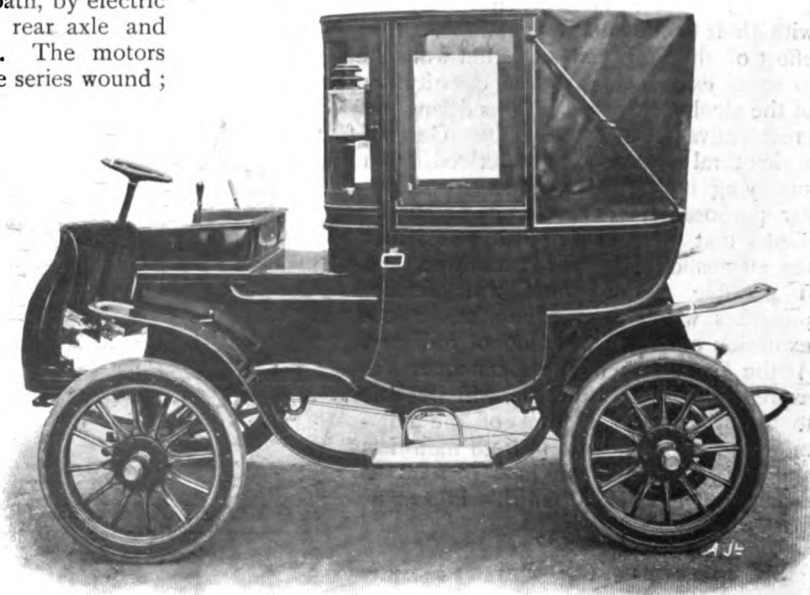
A PROPOSAL has been made by the Mayor of Brighton Alderman Blaker, to hold a motor car Exhibition at the Dome and Corn Exchange in connection with the motor speed meeting in that town in July next.

WE have always protested against the dangerous performances of looping the loop, &c., &c., usually carried out with what is termed a motor car, but

which has nothing but the general appearance of body and the possession of four wheels to entitle it to that designation. Our criticisms have been more than fully justified by the sad end of Mdlle. Randal, who performed in this way, up till recently, in Paris. As the result of the repeated shocks to her system caused by the dangerous performance, the young lady succumbed last Saturday to heart disease, either caused, or at any rate greatly aggravated, by brain affection produced by the dangerous performance. The occurrence is rendered distinctly pathetic by the statement that the deceased performer was compelled by failure in other lines to adopt this dangerous exploit for the maintenance of relatives who were dependent on her. We are glad to hear that the Public Prosecutor is arranging to proceed for manslaughter against those who promoted the performance.

Why the name of the automobile should be dragged into disgusting and degrading exhibitions of this kind, which have nothing but their danger to a human being to recommend them, and cannot even claim the slight palliation of requiring skill for their execution, is a mystery. Had this tragic occurrence taken place in England, no doubt it would be quoted amongst the phalanx of "motor car accidents" served up from time to time to whet the appetites of cranks in Parliament and elsewhere for automobile tragedies.

SINCE the Olympia Exhibition over seventy new members have joined the Society of Motor Manufacturers and Traders, whose roll of membership now comprises 200 firms. The Motor Boat Side of the trade has come forward in specially strong numbers.



A Four-Seated Electric Landaulet, constructed by the City and Suburban Electric Carriage Company. The battery on this carriage is divided, half being placed under the rear seat and half under the driver's seat.

London Motor Omnibus Company, Limited.—The statutory meeting took place last week of this recently formed company, under the chairmanship of Mr. A. J. Salisbury Jones. A very harmonious gathering resulted in consequence of the satisfactory points which were made by the chairman. He mentioned that nearly 1,300 shareholders were on the register, and that they had secured good premises in Albany Street, Regent's Park, which not only afforded accommodation for housing the cars but provided room for repair shop and offices. Mr. Dicks, of the London Road Car Company, had been engaged as traffic manager, and Mr. Bell, of the Milnes Daimler Company, had been appointed head of the engineering department. Two further directors had joined the Board, viz., himself and Mr. Roberts, of the Birmingham Motor Express Company. A service of five 'buses was started on March 28th, and they were now being run about 120 miles per day with two shifts of drivers and conductors to each car. The results, both as regards the number of miles run and the amount of money taken, were far in excess of their best expectations. By May 15th they would have twenty-five 'buses on the road, and their full complement they expected to get delivered by the end of September. In addition to those already contracted for, they had an option to purchase certain English-built cars, two of which were being tested in the country on the company's behalf. The difficulty of tyres had been partially overcome by a contract which they had entered into for three years for maintenance, whereby they would save at least $\frac{1}{2}$ d. per mile run, equal to about £100 per annum per 'bus. They had also contracted for the regular supply of petrol, an important matter, their requirements when in full running order being about 2,000 gallons per day.

The Chairman also announced that a special meeting would shortly be called for the purpose of submitting a proposal for increasing the capital of the company so that they might extend their operations.



COMMERCIAL POINTS.

A DIVIDEND of 33½ per cent. was declared at the general meeting of the Continental Caoutchouc and Guttapercha Company, Hanover, held on April 8th. Business prospects for the year were reported as very satisfactory, the turnover of the first three months of the present year exceeding that of the corresponding period in 1904. New buildings are to be erected during the present year, more especially for the manufacture of motor tyres, and, although during the past year the number of employees has increased by about 20 per cent., a further 600 hands will be required. The larger part of these will be engaged in the manufacture of motor tyres. Those responsible for the affairs of this company have always been solicitous for the well-being of their employees. The date of the general meeting was, therefore, selected for the inauguration of the new workmen's dwellings, which have been for some time under construction. These are situated near the main factory, and are capable of accommodating 390 persons. Each dwelling is fitted up with electric light, and has a small garden attached. In addition, a general meeting-room has been provided, also a reading-room, a library containing about 1,000 books, a children's playground covering 900 square yards, and a recreation ground. The cost of the estate was 412,000 marks, and of the dwellings 640,000 marks, a total of 1,052,000 marks. The erection of additional dwellings later on is under consideration. Amongst those present at the opening ceremony were Privy Councillor B. Gaspar, the chairman of the

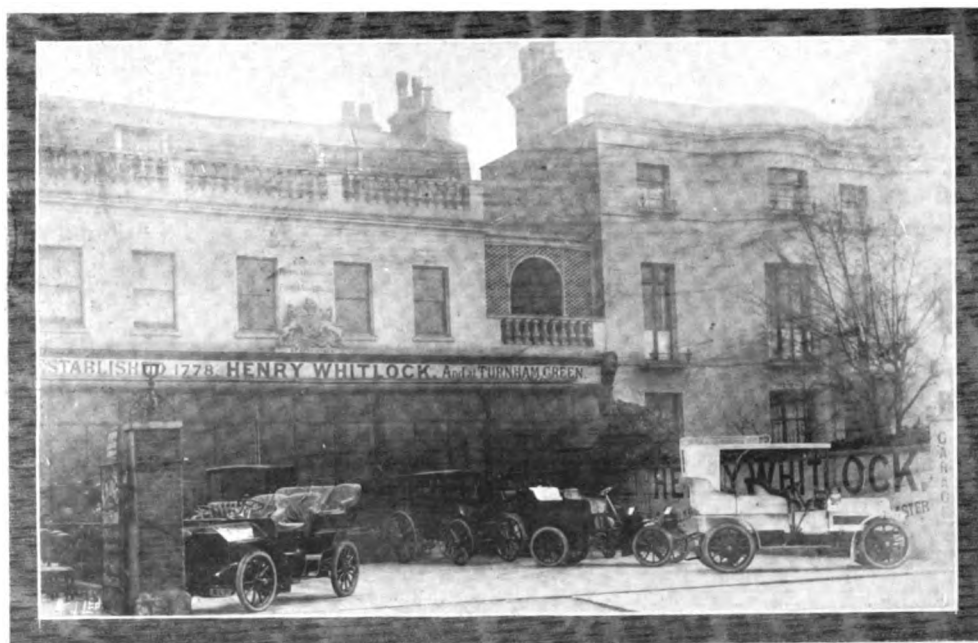
Continental Company; Von Philipsborn, Government representative; Mr. Tramm, Mayor of Hanover; Mr. Werner, President of the Board of Trade, and many others.

Australian Reliability Contest.—We have been furnished with details concerning the Sydney-Melbourne contest, from which it will be seen that the tyres of the promoters—the Dunlop Tyre Company—rendered an excellent account of themselves. Out of the 23 cars that started, twelve were fitted with these tyres. Out of the seven cars that finished in Melbourne—winners of the full number of marks—five were fitted with Dunlops. Mr. Proctor, the Australian manager, states that his company is manufacturing 5,000 covers and about 6,000 tubes per week.

THAT motor boating is making rapid strides in popular favour is daily becoming more apparent. In all directions builders are extremely busy, if not full up, with orders. By way of an illustration of the progress now being made, we learn from Messrs. J. W. Brooke and Co., Limited, of Lowestoft, that they have no less than twelve complete motor boats building, including 19 ft. 20-h.p. yacht's tender for Ian Hamilton Benn, and a 17 ft. 8-h.p. yacht's tender for Mr. Fulcher, of the R.Y.S. In addition, they have on order a 20-h.p. outfit for their agent in Sweden. Another set for Gill and Son, Rochester, 3 and 2-cylinder outfits for Deal, a 2-cylinder for Arundel, a 3-cylinder motor for Brighton, 2-3-cylinder outfits for shipment, another for their Glasgow agent, and about a dozen single-cylinder complete installations. Further work in hand is a 14-h.p. auxiliary equipment, an 8-h.p. auxiliary equipment, both for use on the Norfolk Broads, and an 8-h.p. auxiliary equipment for Messrs. Woodnutt and Co., Isle of Wight.

A LETTER has been addressed to the Dunlop Pneumatic Tyre Company by Mr. C. J. Glidden, now far advanced on his world's motor car tour, which emphasises his previously-expressed good opinion of the tyres on long distance runs on the worst roads. Addressing his letter from Invercargill, New Zealand, Mr. Glidden writes: "Non-puncture record, 2,875 miles, seventy-five per cent. of the distance bad roads, including Ward's Parade, the most southerly track in the world. I believe the tyres are good for Tasmania, and for a large part of our contemplated Australian drive."

BOTH the Napier boats, which scored so splendidly in the early part of the Monaco meeting, we learn, used Castle coils and accumulators which gave no trouble through the whole events.



Many of the oldest coachbuilding establishments in Great Britain have for some time been alive to the importance of grafting automobile carroserie on to their general business of carriage building. A typical instance is that of Whitlock's, one of the oldest carriage builders in existence, whose establishment dates back to the year 1778. As a rule, the front of their premises is now occupied by more automobiles than ordinary carriages, as the above interesting photograph, which recently we secured casually, will show.

British Exports and Imports of Motor Cars, &c., for 1905.

Exports, British and Irish make.							Foreign and Colonial Re-exportation.						
1905.		No. of Cars and Value.	Parts Value.	No. of Motor Cycles and Value.	Parts Value.		No. of Cars and Value.	Parts Value.	No. of Cycles and Value.	Parts Value.			
		£	£		£	£		£	£		£		
January	..	77	25,590	7,480	58	2,026	673	50	19,006	2,733	8	214	138
February	...	62	20,209	6,335	63	2,389	1,003	79	39,772	4,532	2	54	52
March	..	49	14,749	7,862	46	1,471	1,024	36	20,783	3,440	14	290	55
Total	...	188	60,548	21,677	167	5,886	2,700	165	79,561	10,705	24	558	245

NOTE.—For 1904 comparative figures see full table for the year in our issue for January 21st, page 91.

Imports.

1905.	No. of Cars and Value.	Parts Value.	No. of Motor Cycles and Value.	Parts Value.		
		£	£	£		
January ...	362	149,578	36,608	57	1,842	905
February ...	431	195,978	56,773	102	3,748	1,957
March ...	560	239,091	75,463	152	5,369	2,721
Total ...	1,353	584,647	168,844	311	10,959	5,583

DOINGS OF PUBLIC COMPANIES.

NEW COMPANIES REGISTERED.

Sparks-Boothby Hydraulic Clutch (Limited).—Capital, £6,000 in £1 shares. Object, to acquire patents relating to hydraulic clutches, under agreement with G. Sparks and F. S. E. Boothby.

A. Vedrine and Co. (Limited). 16 and 17, Broad Street Avenue, E.C.—Capital £130,000 in £1 shares. Object, to acquire the business of motor car body and accessory manufacturers carried on by A. Vedrine et Cie., at Courbevoie, Seine, France. Directors, A. Vedrine, Alexandre Darracq, Charles Jarrott, Maurice Ulcoq, Camille Bloch, William Kerr Steedman.



BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

11848. 17th May, 1904. Improvements in Governing Oil Engines. David Roberts and Charles James, of Spittlegate Iron Works, Grantham, Lincoln. It has been the practice to regulate the supply of oil to the vaporizer by the governor acting upon a relief valve, which when the speed is excessive allows a certain proportion of oil to escape

bell crank-lever, *h*, pivoted at *g*¹, connected by means of a link, *i*, to an arm lever, *j*, upon a rocking-spindle, *k*, the other arm, *l*, of the lever being connected by means of a link, *m*, to a point on the link, *d*, between the plunger, *c*, and the quadrant, *e*. The quadrant, *e*, is fixed to a lever, *n*, pivoted at *o* to a bracket, *p*, and in connection with the rod, *q*, operating the air admission-valve. The rod at its lower end carries a roller, *r*, which is actuated on by the cam, *s*, on the half-speed-shaft. When the engine is running, the operation of the governor moves the link, *d*, over the quadrant, *e*, as the speed of the engine varies, thus adjusting the movement of the pump-plunger, *c*, in accordance with the speed.

9011. 19th April, 1904. Improvements in Clutch Mechanism. M. G. de Simone and D. R. de Simone, of 37, Southampton Row, London. The object of this invention is to provide a clutch for motor vehicles easier of manipulation and control than those ordinarily in use. A number of hydraulic

Fig. 2 is a part sectional elevation. The flywheel, 1, which forms one member of the clutch, has the inner surface, 2, which is eccentric to the axis of the flywheel, 1. The driven shaft, 3, is in line with the flywheel shaft, and it carries the clutch-member, which contains the liquid-chambers, 4, communicating through valves, 5, to four radially-arranged cylinders, 6, in which reciprocate four plungers, 7, carrying anti-friction wheels, 8, at their extremities, which bear against the inner surface of the eccentric ring, 2. The valves, 5, between the liquid-chamber, 4, and the cylinder, 6, permit the passage of the fluid freely through from the chamber to the cylinder when it is desired that the engine shall run free. The valves, 5, fit the seatings, 11, and are operated by rods, 9, connected to a sliding flange-sleeve on the shaft. If the valves, 5, are held closed, no liquid can pass, and the plungers, 7, will be held and locked in position, so that the two members of the clutch rotate together. April 13th, 1905.

Patent Specifications Published.

Applied for in 1904.

Published April 20th, 1905.

- 7,526 H. FISPER. Motor vehicles.
- 7,740 M. THIER. Cylinders.
- 9,631 A. LAFARGUE. Resilient tyres.
- 9,918 F. PRICE. Gas, petrol, and oil engines.
- 10,136 E. V. GRATZ. Contact breaker.
- 11,120 S. J. AND E. FELLOWS, LTD., AND A. NIGHTINGALE. Intl. combn. engines.
- 10,837 E. B. HASELTON. Tyre covers.
- 20,592 L. HARRIS. Minimising vibration.
- 21,537 G. J. SHAVE. Regulating stroke of steam generators.
- 28,604 J. SPYKER. Chassis.
- 29,441 J. SPYKER. Steering apparatus.

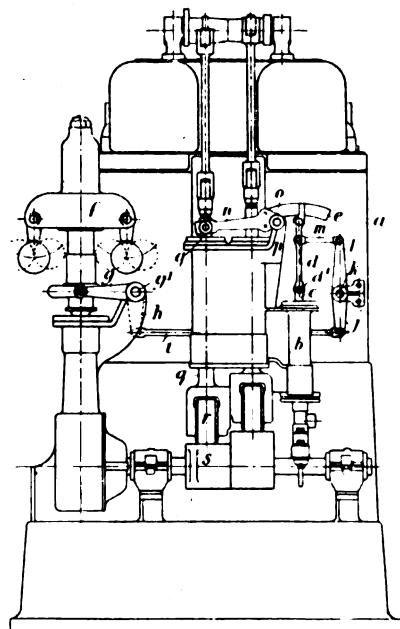
Published April 27th, 1905.

- 7,563 GANZ AND CO. Intl. combn. engines.
- 7,741 M. THIER. Valve gear.
- 7,848 M. M. AND A. E. DESAU. Anti-slipping shields for tyres.
- 8,140 F. MITCHELL. Variable gearing.
- 9,809 W. HARTMANN. Valve gearing.
- 10,274 E. F. PIERCE. Resilient wheels.
- 11,270 C. C. BRAMWELL. Differential gear.
- 12,741 SOC. PANHARD AND LEVASSOR. Electric ignition apparatus.
- 12,933 E. W. BACHE. Spring wheels.
- 13,210 ALHION MOTOR CAR CO., LTD., AND T. B. MURRAY. Mechanical feed lubricators.
- 27,744 A. ALTMANN. Motor road vehicles.

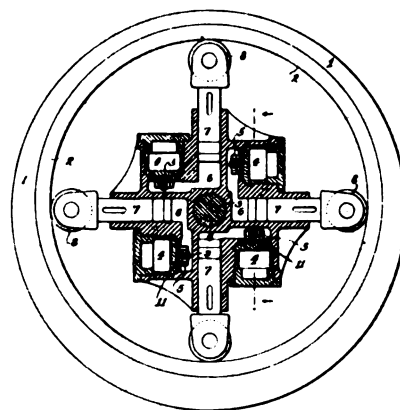
Applied for in 1905.

Published April 20th, 1905.

- 4,438 FRIED. KRUPP AKT.-GES. Ignition plugs.
- Published April 27th, 1905.
- 1,279 G. VON RIEDEL. Two-stroke motor.
- 2,095 T. B. BROWNE. Motor road vehicles.



and return to the oil tank. In this invention the stroke of the oil-pump is regulated by the governor to supply the required quantity of oil to the vaporizer. The engine, *a*, has fitted the oil pump, *b*. *c* is the pump-plunger, *d* the link pivoted at *d*¹ to the upper end of the pump-plunger, *e* is a quadrant to which the upper end of the link, *d*, is also attached, and the curve of which is described from the point, *d*², as centre when in the position shown. *f* is the governor, and *g* is a fork which engages with the sliding-sleeve thereon. It is connected to the



plungers, forming one member of the clutch, are so disposed as to engage an eccentric surface of the other member of the clutch. When the clutch is required to run free, the contained liquid is allowed to run freely from one cylinder to the other, so that the eccentric surface causes the plungers to reciprocate. When the plunger is required to act, the liquid is locked within the cylinders, and they are thus held rigidly within and against the eccentric surface, so gripping it that both members of the clutch rotate together. There are three figures.

The Automotor Journal, April 29th, 1905.

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MONACO AND NICE MEETINGS.—A characteristic scene at Nice, where the automobile has recently been in such great prominence.

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DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
May 6...	Auto Cycle Club Hill Climb.
May 10-13 ...	Scottish A.C. Reliability Trials.
May 12 or 19...	*Quarterly 100 Miles Trials.
May 13 ...	Auto Cycle Club Members' Penalty Run.
May 20 ...	Motor Union Inter-Club Meet (Welbeck).
May 20 ...	200 Miles Trial (Motor Cycling Club).
May 30 ...	*Gordon-Bennett British Eliminating Trials.
May 30 ...	Auto Cycle Trials and "Selection" Race.
June 3 ...	Bexhill Race Meeting.
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.).
June 10 ...	London-Edinburgh (Motor Cycling Club).
June 24 ...	100 Miles Passenger Trial (Motor Cycling Club).
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 4-5 ...	*Motor Boat Trials (Southampton).
July 8... ..	Auto Cycle Club Consumption Trial.
July 12 ...	*Hill-Climb (Henry Edmunds Trophy).
July 19-22 ...	*Brighton Speed Races.
July 27-28-29	*Blackpool Motor Meeting.
July	24 Hours Run (Motor Cycling Club).
Aug. 11 or 18	*Quarterly 100 Miles Trials.
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 19 ...	*Van Trials, Light and Heavy Vehicles.
Aug. 26 ...	Inter-Team Trial (Motor Cycling Club).
Sept. 9 ...	Brown Cup (Motor Cycling Club).
Sept. 12 ...	Auto Cycle Club Race Meeting.
Sept. 14 ...	*Tourist Trophy (Isle of Man).
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).

* Automobile Club of Great Britain and Ireland Events and Papers.

Sept. 18-Oct. 3	*Reliability Trials.
Oct. 4 ...	*Speed Trials.
Nov. 10 or 17	*Quarterly 100 Miles Trials.
Nov. 17-25 ...	Society of Motor Manufacturers and Traders Exhibition at Olympia.

Foreign Events (Trials, Races, &c.).

1905.	
May 11-25 ...	Stockholm Automobile Exhibition.
May 13-21 ...	Auto Cycle Club de France Tour.
May 15-17 ...	Italian Tourist Trial (A.C. Milan).
June 16 ...	French Selection Race for G.B.
June 18 ...	International Motor Cycle Cup.
June 20-28 ...	Aix-les-Bains Week.
July 1 ...	Boulogne-Cape Gris-Nez (Motor Boats).
July 5 ...	Gordon-Bennett Race.
July 9-22 ...	Ostende Automobile Meeting.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Calais-Ramsgate (Motor Boats).
July 16 ...	Mont Cenis Hill Climb.
July 20-26 ...	Paris-Trouville (Motor Boats).
July 28 ...	Gaston Menier Cup (Motor Boats).
July 28-Aug. 8	Paris Industrial Vehicles Trials (A.C. France).
Aug. 6-7 ...	Circuit des Ardennes.
Aug. 10-16 ...	Herkomer and Bleichroder Races.
Aug. 11 ...	Anthony Drexel Cup (Motor Boats).
Aug. 12 ...	International Cup for Motor Boats.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Vincenzo-Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.
Sept. ...	Tourist Car Trial (A. C. de France).
Sept. 3-10 ...	Royan Meeting.
Sept. 3-10 ...	Spa Automobile Club.
Sept. 11 ...	British International Cup (Motor Boats Arcachon).
Sept. 12-14 ...	Lake Lucerne Motor Boat Meeting.
Oct. 1 ...	Chateau Thierry Hill Climb.
Oct. 15 ...	Gaillon Hill Climb.

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PASSING EVENTS.

More Recklessness.

IT was only last week that the automobile world and the general public was startled by a most serious accident on the Holyhead road. Scarcely has the very ill-effect produced by this occurrence time to make itself generally felt when an even more shocking accident is reported from a Hertfordshire village, not far from Dunstable. Early last week a car, containing three motorists, was travelling through Markyate, when it ran over a little boy of about four years old, and killed him practically on the spot. This, of course, was in all human probability an accident, and an accident merely. According to report, however, the motorists continued their journey without stopping to see what injury they had occasioned.

The amount of irritation, indignation, and one might really say positive fury, that an incident of this kind, following so closely on the episode of last week, is certain to produce throughout the whole country, and particularly in the neighbourhood of the spot where the accident took place, is incalculable. The driver has now been discovered, and has given himself up to the police, and there seem grounds for believing that he at any rate was not aware, at the time, of the tragic character of the accident that had taken place. All possible commendation is due to the owner of the car—Mr. Hildebrand Harmsworth—for the enquiries which resulted in establishing the fact that his driver was concerned in the accident. The driver appears to have admitted that he was aware something at any rate had occurred, and the accident should prove an awful example to everyone to pull up immediately, without hesitation, whenever there is the slightest ground for even imagining that an accident has taken place. Whenever there is an accident, especially a fatal accident, in a country district, the result is to revivify for a considerable length of time local hostility to the movement. If, in addition to the accident, there is the slightest suspicion that the cause of it hurried away from the spot at which it took place, or in any way displayed a want of ordinary human sympathy, the intensity of this hostility is not unnaturally, though perhaps somewhat illogically, enormously increased. As we have said before, and again repeat, a few more incidents like this, and the racing car accident of last week, and the next Motor Car Bill that passes through Parliament will be of such a character as to introduce restrictions exceedingly irritating to automobilists and likely seriously to interfere with automobile commercial development. Of course, the position of the movement is now such that even the most reactionary Parliament would scarcely dare to attempt legislation obviously designed to destroy mechanical road traction. But our Legislature in a moment of panic is quite capable of passing measures which would be highly restrictive, and, considering the keenness of foreign competition, this would be disastrous enough.

Vigorous Action by the Club.

THE Automobile Club, which has regularly and persistently set its face against reckless driving on the highway, and has invariably done everything that it can do to stop it, has taken vigorous action in view of the recent serious accidents that have taken place. While the driver concerned in the Markyate tragedy still remained unidentified, the whole club organisation

was energetically put in action by the club secretary for the purpose of ascertaining who was really to blame. Drastic action has also been taken in regard to other drivers who have been concerned in accidents by summoning them before the club committee, and Colonel Holden, the chairman of that committee, has drawn attention to the circular sent out by the club to the general Press this time last year on inconsiderate driving, in which the regulations adopted by the club for dealing with the question were described and explained.

In addition to these measures, the General Committee of the Motor Union, at a recent meeting of the Union, passed the following resolution:—

“That a small committee be appointed to consider the question of inconsiderate driving, with a view to ascertaining what action could be taken by the Union to check such driving, in the case of automobilists who are not members of the A.C.G.B.I., and in what way the Union could co-operate with and support the committee of the A.C.G.B.I. at present dealing with the matter.”

The two leading automobile organisations of the country are thus doing all that lies in their power to eradicate the recklessness of which the recent results have been so tragic, and so calculated to seriously injure the prospects of the movement.

There can be little doubt that car-owners are themselves comparatively seldom to blame. Trouble is much more frequently caused by their paid drivers, when allowed either to take cars home from a distance, or, what is still more reprehensible, enabled, as the result of imperfect control, to take cars out to amuse themselves and their friends without any knowledge on the part of the owners. We would suggest that, in addition to the active measures which the Automobile Club and the Motor Union, as above described, have adopted, they should endeavour to impress upon all their members the intense importance of greater care and supervision in these respects. However careful and considerate an owner is, and however solicitous he may be to avoid affording the enemies of the movement the slightest pretext for hostility, the whole of the good that his example and practice produce may be far more than counterbalanced by a thoughtless or reckless chauffeur in his employment, who takes his car out, either with or without his authority, for a couple of hours on a single afternoon. The mere fact of a driver being a capable mechanic, an excellent driver, and, as far as can be judged, careful when his employer is with him, is unfortunately but little guarantee as to what he will be when left entirely to his own resources. Every car-owner who has (as all should have) the future of the movement at heart, should make a rule of sacrificing his personal convenience rather than allow the driver he employs even occasionally uncontrolled freedom in this respect.

Combating the Dust Nuisance.

THE general adoption of scientific and systematic measures for combating the dangerous nuisance of dust on our high roads which was, at any rate, a contributing cause to the serious accident to which we referred last week, and is a source of such general danger and irritation, is becoming more and more imperative, so that we have pleasure in drawing our readers' attention to a well-thought-out and systematic article on the subject by A. Lyle Rathbone, which appears in another part of the present number of the Journal. Apart from the interesting information which this paper con-

veys, its usefulness and importance is mainly due to the fact that it draws attention to the vital distinction between the principal means for combating the trouble which have been hitherto put in operation. When a road has once become dusty, any methods which can be adopted for allaying or diminishing its dustiness, other than that of entirely remaking the road, are essentially of the nature of palliatives only. As such they necessarily require frequent renewal, and may be regarded as analogous to attempts to treat headache due to disorganised liver by sedatives without striking at the root of the evil. It is in making up the road in the first instance that the disease is as a rule introduced, and the paper shows how it may be enormously diminished, or practically got rid of altogether, by adopting the most up-to-date methods of road construction. There is practically no doubt about the truth of this contention. It has been proved by Mr. Hooley in the Nottingham district up to the hilt. But what interferes with its application is the belief in its greater expense. This it is which deters the local authorities, whose business it is to keep our roads more or less in order. Their objection to go to increased expense is natural enough, but, as a matter of fact, it is really short-sighted, because the methods to which we refer, though they may be more expensive in the first instance, save enormously in the upkeep of the roads to which they are applied. The object of the local road authorities is of course to keep down the highway rates, but it is practically certain that by adopting one or other of the improved methods of road construction in the first instance, where roads have to be made up, the diminution in yearly expenditure would considerably outweigh the initial increased cost, and as the cost of maintenance can be distributed over a considerable period there is no reason why any increased burden should be imposed on the ratepayers. It is to be hoped that the Press generally will make a point of affording wide publicity to these facts, as it is only when the responsible authorities become convinced of their truth that a substantial general improvement in our high road can be expected. Of course, there are some few councils so prejudiced against the automobile movement in the less civilised parts of the country as not to be very anxious to diminish dust, as the prejudice which dust creates against the automobile movement is rather agreeable to them than otherwise, but these we trust are few. Their number is gradually diminishing, and we look to the Roads Improvement Association, which has done such good work in matters of this kind, to effect their conversion and to convince our highway authorities generally that scientific reform, and other methods of road making, will both practically get rid of the intolerable nuisance, and actually prove cheaper to them in the end.

Electric versus Automobile Traction.

THERE seems to have been a regular whip sent out by the electrical Press. At any rate, all sorts, kinds, and conditions of electrical engineers have been rushing into print, both in defence of the electric tram system, and to attack the motor 'bus. As we pointed out at the time, certain Radical papers opened the attack, and we have seen, with a good deal of regret, that their example has been followed by the technical electrical Press, the general high standing of which had led us to expect better things of it. As a regular phalanx of electrical engineers

have been whipped up to the defence of the electric tram and the attack of the automobile 'bus, it is with interest that we put before our readers an article by an electrical engineer of many years' experience, which was sent to us by him, without any suggestion on our part. It will be seen that his view of the situation is the exact opposite of that of the writers who hold a brief for the other side. In spite of a long apprenticeship to the merits of electrical distribution as a system of transmitting power to road vehicles, he has no doubt whatever about the ultimate triumph of the internal combustion-engine or other similar self-contained power-generators. We do not think that his general position can for a moment be impugned, for, after all, electric traction—from a commercial point of view, at any rate—is only a means of distributing energy over a wide area, and far from an economical means at that.

♦ ♦ ♦

The Dependence of the Electric Motor.

OF course if electricity could be generated direct, in light compact apparatus, from cheap fuel, then cars could be equipped with electric motors and with this ideal generating plant, and in that case the whole situation would be revolutionised. Such vehicles would make delightful motor cars, and perfect motor 'buses, and there would no longer be any need for tramlines or for distribution from afar. Attempts have been made to convert heat directly into electricity, but they have not even been successful from the laboratory point of view, and though the thermopile, a laboratory instrument for doing this, exists, its power is very limited, and it is very wasteful. Now the petrol, and the steam engine, do effectively what such an ideal electric generating apparatus (combined with motors) would do. They produce mechanical energy—movement—on the spot from a material that can be carried with them. That is the essential difference between a prime mover and a secondary mover. The former converts a substance—fuel—into movement, the other can only convert energy of one kind, derived from an external source (in the case in question, electricity), into energy of another kind, viz., motion. Under existing circumstances, electric motors are as dependent on the conductors carrying the current as hydraulic motors on the system of water pipes that feed them.

♦ ♦ ♦

The Prime Mover versus the Secondary Generator.

THE reason why the automobile engine will win the battle is that a vehicle equipped with it, with all the necessary accoutrements of fuel tanks, radiators, transmission gear, and the like, is but little, if at all, heavier than an electric vehicle equipped only with its motors, and it is a wholly independent unit. The electric vehicle must, in addition to its motors, either carry with it a battery (accumulators, or the quite uncommercial primary battery), which is far heavier than any ordinary load of passengers it could be expected to accommodate, or it must, as in the case of the electric tram, take its energy from a distribution network. There is then the enormous initial capital expenditure required for laying down a system of mains and rails, for setting up the central generating stations (where the prime movers, steam or other engines, provide the electric current), and, in addition to all this, there is the leakage and loss in transmission. Further, there is the restriction to special routes, and that,

perhaps, is as serious as anything. But, above all, a single breakdown will block a whole service of trams, to say nothing of impeding in consequence the rest of the street, while the tram itself is precluded from yielding in any way to the traffic of the road. As off-sets against all these disadvantages, is the important one of the ability to use cheaper fuel at the central generating station. But, even now, this is largely counterbalanced by the great losses in transmission, and the enormous capital expenditure involved, the proportion of the annual interest and depreciation of which must of course be added to the losses in transmission. Another advantage also possessed by the electric tram is that less skill is needed on the part of the drivers, as they have no steering to do, and are merely required to moderate the paces of the "megatherium" which they control, but, with the growth of skilled automobile drivers, the importance of this matter is becoming daily less and less. To give the tram its due, it has, too, the further advantages that its steel tyres are more durable than the rubber tyres on a 'bus, and that less power is required to move a vehicle along rails than over the surface of a road, but, here again, the progress that has been made recently, and still continues to be made, is rapidly equalising such minor matters as these. We believe the writer of the article to which we refer is thoroughly in the right in saying that, but for the vested interests involved in the maintenance of the electric tram system, it would be abandoned almost immediately. How enormous these vested interests are is sufficiently proved by the promotion of the recent Bill to save something from the wreck (in London at any rate), by empowering the electric trams to run over the bridges and invade the Embankment. And while these interests continue, they will probably ensure an existence, though not a future, for electric traction. As far, however, as existing undertakings are concerned, at any rate in the Metropolis, there is probably plenty of room for both the electric tram and the automobile 'bus. And the representatives of the former interests have certainly not improved their position by the uncalled-for attacks they have made on the latter. When we deal with the physical aspects of the case, however, the situation is different, and the prospects of the independent vehicle propelled by a satisfactory prime mover are such that little doubt can be entertained of its ultimate victory.

A Matter for Early Legislation.

WE have on more than one occasion referred to the recommendations put forward by the Departmental Committee on Highways of a number of suggestions, the progressive character of which proposals is undoubtedly due to the energetic action of the Roads Improvement Association and the character of the evidence which the officials of that body supplied to the committee. The Council of the Association has prepared a Bill formulating with considerable skill the recommendations agreed upon by the Highways Committee, and at the meeting held last week by the members of the Association, the principal features of the proposed Bill were discussed. Should it pass into law, it will create a central department for the purpose of supervising and assisting the activity of the local highway authorities who repair and maintain the roads from parish to parish. The highway powers possessed by county councils will also be largely increased, a proposal of which everyone must be in favour, considering the enlightened way in which the

county councils have employed the powers they at present possess. In addition to these important suggestions, it is proposed that the interests of ratepayers shall be protected, at any rate those living in suburban districts, by laying out plans of road improvement in accordance with some general arrangement, so that in future we shall not witness the absurdity, so often seen in the past, of a scheme being introduced at great expense, only to be abandoned in favour of a newer one before it has been fully carried out, while, as far as possible, these districts themselves are to be laid out so as to prevent houses and buildings impeding ultimate road improvement. As both the Departmental Committee, and so influential and representative a body as the Roads Improvement Association, are agreed on the proposals to be adopted, it is to be hoped that Parliament will, at an early date, be able to snatch sufficient time to pass the recommendations, of which both bodies are agreed, into law.

A Far Eastern Opening for the Motor Boat.

THE *Board of Trade Journal*, well served, as usual, by the Consular reports of other powers, draws attention to the probable great future prospects of China as a market for motor boats and a delightful sphere for motor boating. The Middle Empire is a country of great rivers and great canals. In fact, the canal was the principal means of locomotion there before the similar waterways of Holland or even Venice existed. The importance of canal and river life in China is amazing. Nearly a half of the whole population exist more or less permanently on the water. One of the principal means of locomotion indeed is provided by houseboats transported from spot to spot by steam tugs. For some reason or other, there is an invincible repugnance in China to the extension of railways, and it will be many long years before this time-honoured method of progression is ousted by land locomotion. At the same time, the supply of ordinary tug boats is quite inadequate, and there is a great and growing demand for power-boats on all the great canals and rivers, both for public and private service. The Chinese themselves are expert boat-builders, and the Consul is of opinion that a very flourishing trade might be developed, if European manufacturers would arrange to export motor-boat engines, and machinery of a cheap, durable, and simple kind, to China, and have them fitted to boats on the spot. A lucrative trade would thus probably grow up, and produce a marked effect in the general opening up of the country to European commerce.

A GENERAL notion has grown up that motor cars, when going too fast round corners, elevate their *outside* wheels. Needless to say this is a complete delusion, but it was nevertheless put forward as evidence of the speed and reckless driving in an action for damages recently brought at Chester by the father of a little girl who was knocked down by an automobile, it being stated that as the car concerned went round a curve its outside wheels rose two feet in the air. In spite of this evidential absurdity, the plaintiff, it is almost unnecessary to say, was awarded damages to the extent of £10.

MONACO MEETING.—A batch of our exclusive photographs in connection with Monaco Motor Boat Race Meeting unfortunately went astray last week. We therefore make no apology for reproducing this week a selection of these, which reached us just after we had gone to Press.

MR. LIONEL DE ROTHSCHILD'S SIDDELEY RACER.

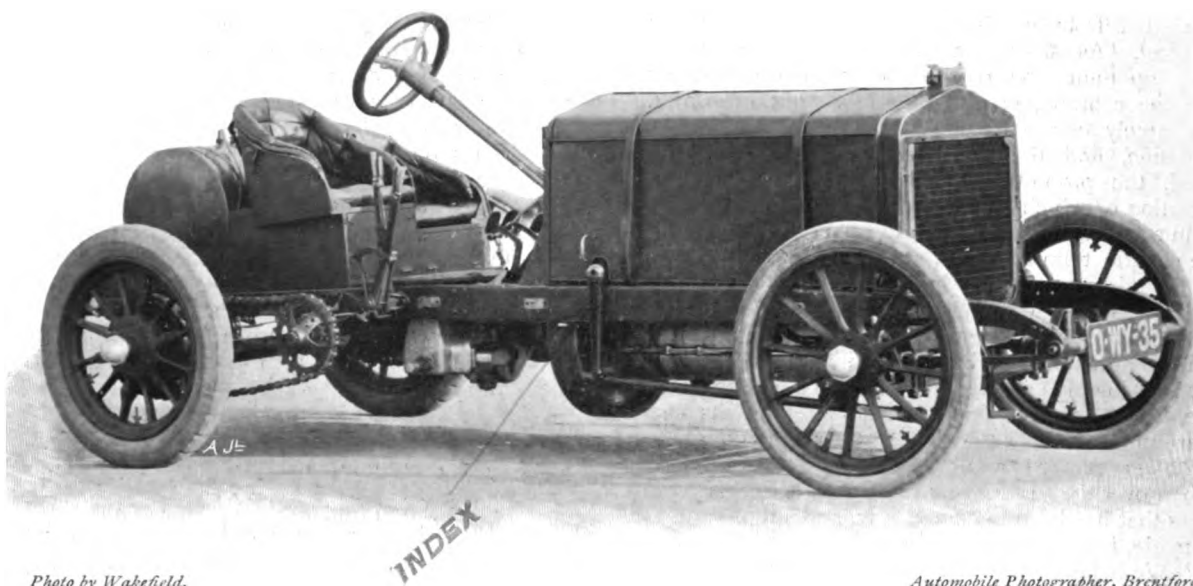


Photo by Wakefield.

Automobile Photographer, Brentford.

Fig. 1.—Mr. Lionel de Rothschild's Siddeley Gordon-Bennett Racer. View from the "off" side.

THE racing car which has been built by the Wolseley Company—for the Siddeley Company, who have now been absorbed by them—is one of the finest examples of automobile construction and design that it has been our pleasure to see. It has, it will be remembered, been built to the order of Mr. Lionel de Rothschild, and has been entered as a competitor to represent this country in the Gordon-Bennett Race this year. Our illustrations not only show its external appearance from two different points of view, but include views of the engine from both sides. The car is of the chain-driven type, has its

large vertical engine enclosed beneath a plain bonnet, has the petrol tank fixed across behind the driver's seat, and is constructed with a view to reducing the weight as far as possible throughout.

Before describing the general construction, it would be as well—following our usual practice—to enumerate briefly the special features possessed by this powerful machine, for in many respects it differs from previous practice in connection with racing vehicles. The 4-cylinder engine and the gear-box are each secured to the main frame with a three-point suspension, and the

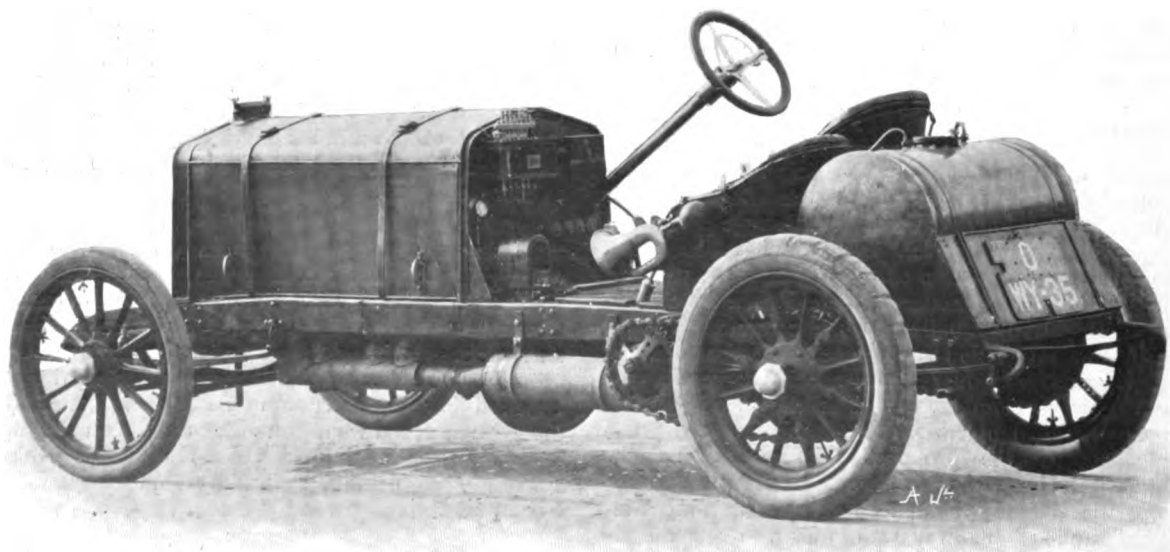


Photo by Wakefield.

Automobile Photographer, Brentford.

Fig. 2.—Another View of Mr. Rothschild's Siddeley Gordon-Bennett Racer, built by the Wolseley Company.

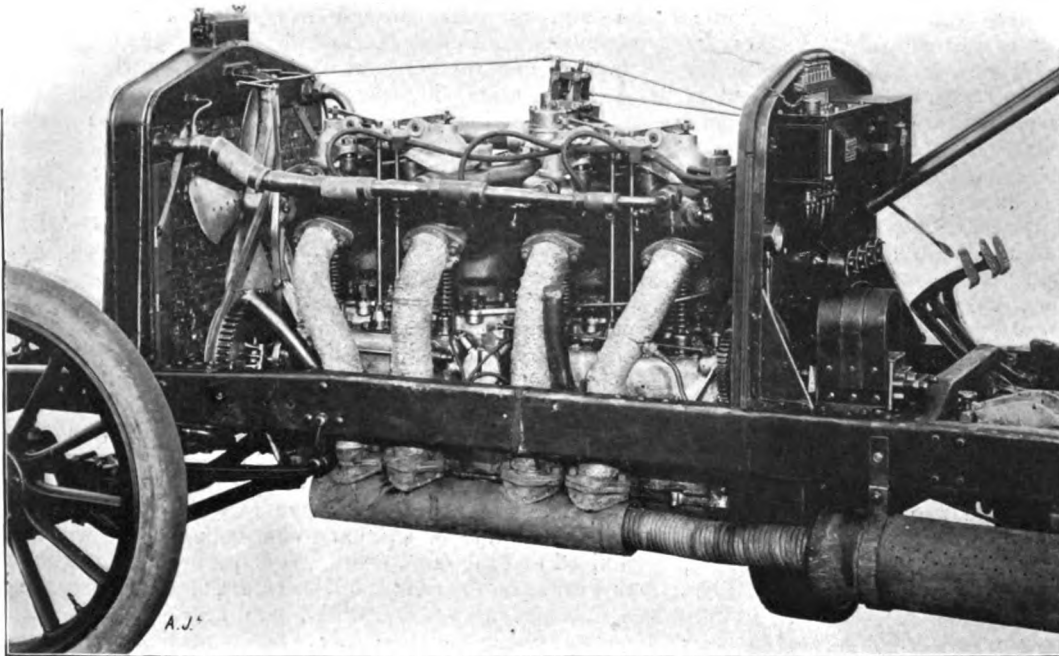


Photo by Wakefield.

Automobile Photographer, Brentford.

Fig. 3.—The 100-h.p. Engine, fixed in place in the Siddeley Racer. View from the "near" side, showing the arrangement of the valves, the high-tension ignition-plugs, the commutator, and the low-tension magneto.

main clutch—which is introduced in the usual manner between them—is of the multiple-disc type. The inlet-valves lie above the exhaust-valves, and are of the concentric or double-ported type, but although they are operated from the same cam-shaft, and although they serve as inspection-covers for the exhaust-valves, yet they are placed somewhat eccentric to those other valves. Two systems of ignition are provided, the one of the low-tension type, for which a magneto is employed, and the other of the high-tension type, with accumulators and coils. The engine-driven portions of both systems are arranged in an unusual manner, for a transverse shaft, which is driven by the cam-shaft, passes across the centre of the crank-chamber, and this shaft in

turn drives a longitudinal shaft which carries the ignition cams on the other side of the engine. The transverse shaft has the commutator mounted on its one end, and the circulating-pump on its other end, both these mechanisms being therefore unusually accessible.

Another specially interesting portion of the engine is the hollow crank-shaft, which is supported by three long bearings, and is a remarkably fine piece of workmanship. The webs between the crank-pins have an H cross-section, and thus it has been

possible to materially reduce the weight of the shaft, while still maintaining the necessary degree of strength for the work which it has to perform. The carburettor, which is fixed above the cylinders on the opposite

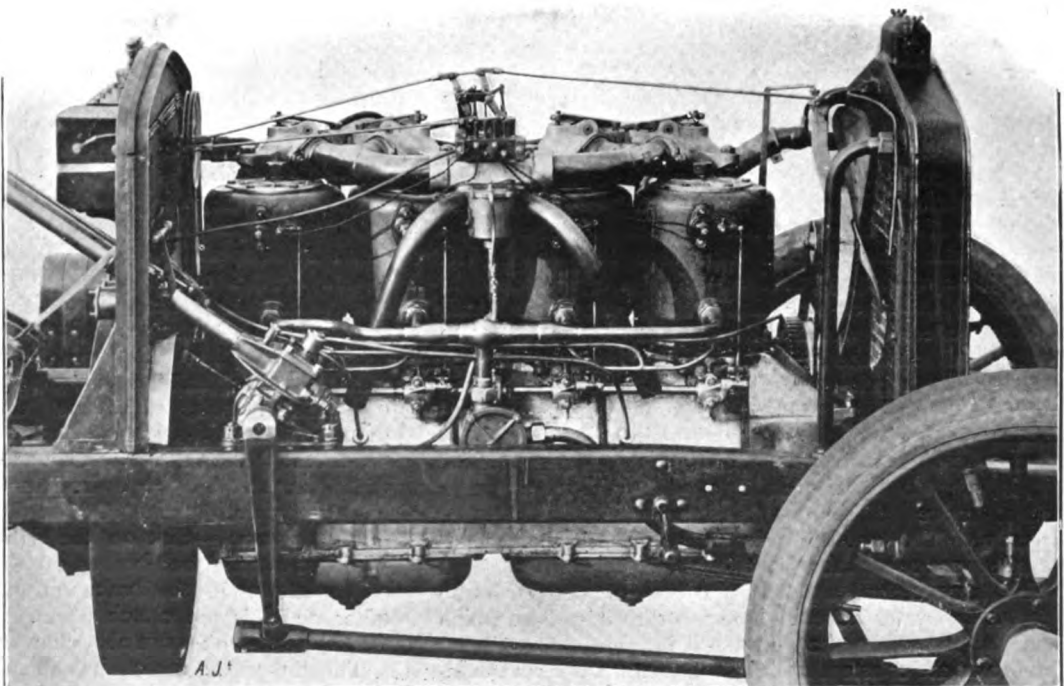


Photo by Wakefield.

Automobile Photographer, Brentford.

Fig. 4.—The 100-h.p. Engine, fixed in place in the Siddeley Racer. View from the "off" side, showing the carburettor, the low-tension igniters, the circulating-pump, and the steering-gear.

side to the valves, has two jets that are arranged in parallel with one another, and the duplex throttle-valves, which form a part of the complete apparatus, are—with but little modification—of the latest Wolseley compensating type that has recently been described in our columns. A pressure-feed system is employed, both for the petrol and the lubricating oil, but the oil is fed to the engine by a belt-driven lubricator of the mechanical type that is fixed to the dashboard. The change-speed-gear is designed, to a certain extent, upon "Mercedes" lines, and it—like the road wheels—has ball-bearings throughout. Three forward-speeds and a "reverse" are available, and the shafts carrying the gear-wheels are both extremely short. The whole of the change-speed mechanism—as also the differential countershaft—are contained in an aluminium casing which is rendered thoroughly dust-proof, and the differential-gear is of that type in which ordinary straight-toothed spur-wheels are employed in lieu of bevel-wheels. Another distinctive characteristic of the Siddeley car is, that there are two brake-pedals as well as the brake-lever at the side; the hubs of each of the rear wheels have internal as well as external brakes, while the third brake is mounted on the front end of the second-motion-shaft. The wheel base is 9 ft. 1 in., the track 4 ft. 6 in., and the wheels have 32-in. Dunlop tyres; the front tyres are $3\frac{1}{2}$ in., and the back are 5 in. wide.

The pressed steel main-frame, which is 5 in. deep in the centre and has a channel cross section; is of a uniform width throughout its entire length, and is supported on the usual semi-elliptic side springs. The front springs are prevented from acting too freely by a special form of "damping" device that is fitted to them, and both the axles are steel forgings having an **I** cross-section. The front axle is carried well forward, to ensure a more equal distribution of the weight, and is, in fact, slightly in front of the radiator. In front, the springs lie beneath the side members of the frame, and at the back, they are outside them, while the lever-arm that projects downward from the steering-gear lies outside.

Each of the four cylinders; which, together with their heads and jackets, form separate castings, are bolted to a main crank-chamber-casting, having separately detachable base chambers beneath each pair of cylinders. The crank-chamber is fixed near its rear end to each of the side members of the frame, and is at its front end secured centrally to the front member. The valves all lie on the left side (as seen in Fig. 3), the inlet-valves being held down in place by induction-pipe fittings that carry the small pivoted levers by which the valves are operated. The cam-shaft for all the eight valves is enclosed in the main casting, and is driven from the crank-shaft by a pair of spur-wheels in front. Owing to the position of the carburettor, the branched induction-pipes are unusually short, and, owing to the coupling flanges being slotted, it is easy to remove either of the inlet-valves in a short space of time—only two nuts have to be removed and another pair slackened. The cylinder-castings are remarkably light for their size, and are fitted with large central aluminium cover-plates to form the top of the water-jackets. The two throttle-valves, which form a part of the carburettor-fitting, and maintain an approximate constant richness of mixture, are automatically controlled by a centrifugal governor that is mounted on the front end of the cam-shaft. but they are also connected with one of the small hand-levers above the steering-wheel, and with an "accelerator-pedal."

The high-tension ignition plugs (which are visible in Fig. 3) pass through the walls of the valve-chambers and lie horizontally. The commutator used in conjunction with them is also clearly visible in the same illustration, it being mounted—as already mentioned—on the end of a transverse shaft that passes across and receives the circulating pump on the right-hand side (see Fig. 4). Referring to Fig. 4, the position of the low-tension igniters will be seen at a glance, for they are fitted into the walls of the cylinders on that side, and are operated in much the usual way by springs and by cams on an independent cam-shaft. The electrical connection to each igniter is made with a plug fitting from a distributor board, so that either igniter can be readily disconnected for testing purposes. The magneto for supplying the necessary current to these igniters is fixed immediately in front of the mechanic's seat, behind the dashboard, and is driven by a pair of spur-wheels from the rear end of the main cam-shaft. Both ignition systems are connected with the "timing-lever" above the steering-wheel, to enable the time of ignition to be varied, and it will be noticed that the same neat design has been adopted on this car as on the 1905 Wolseley racers, for connecting the hand-levers, above the wheel, with those parts of the engine which they control; the connecting rods pass down outside, instead of inside, the steering-pillar.

The radiator is built up of small horizontal finned tubes, fitted in a rectangular frame that also forms the water-tank, and the air is drawn through it by a belt-driven fan. The filling cap on the top of the radiator is—like that for the petrol tank—arranged in such a way that it can instantly be removed, and that it then affords an extremely large opening to avoid any unnecessary delay on the road. The mechanical lubricator on the dashboard has six sight-feeds, which are connected up with the cylinders and the main bearings, but there is also a hand-pump placed close to the mechanic's seat to enable him to force oil into the crank-chamber.

The multiple-disc clutch is so designed that no end-thrust is imposed on the shaft when the clutch is in use, and that all the discs work in an oil bath. The clutch is connected with the first-motion-shaft of the gear-box by a flexible coupling, and—as we have already said—the gear-box is secured to the frame at three points only. The sliding wheels ride upon the first-motion-shaft, and a pair of sliding spur-wheels on an independent stationary shaft serve to give the "reverse." The speeds are all operated by a single side lever, which can be moved sideways into either of three alternative notches; the second-motion-shaft lies to the right of the first-motion-shaft. In addition to the "load-carrying" ball-bearings employed throughout the transmission gear, there are ball thrust-bearings on the second-motion-shaft and on the countershaft to take the thrust of the bevel-wheels, while, on the front end of the former shaft, is the brake-drum, to which reference has already been made. Of the three pedals—visible in our illustrations—that on the right operates the compensated internal hub-brakes on the road wheels, that on the left applies the brake on the gear-shaft, and the other pedal is the clutch pedal. The hand-operated, external hub-brakes are also compensated.

This interesting vehicle has already proved itself to be extremely fast during its trial runs, and is—like all the work that comes out of the Wolseley factory—an excellent example of what can be done with first-class workmanship and material in a really well-managed British workshop.

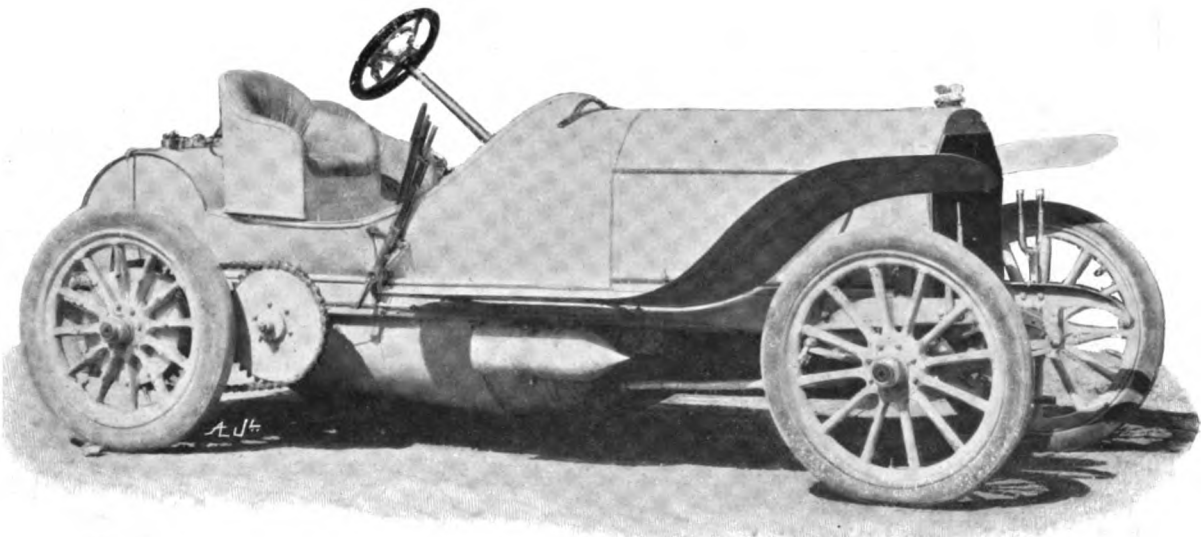


Photo by "Allgemeine Automobil Zeitung" (Vienna Edition).

The first of the 1905 German Mercedes Racers, which has been built to compete for the Gordon-Bennett Cup, and is to be driven by Baron de Caters.

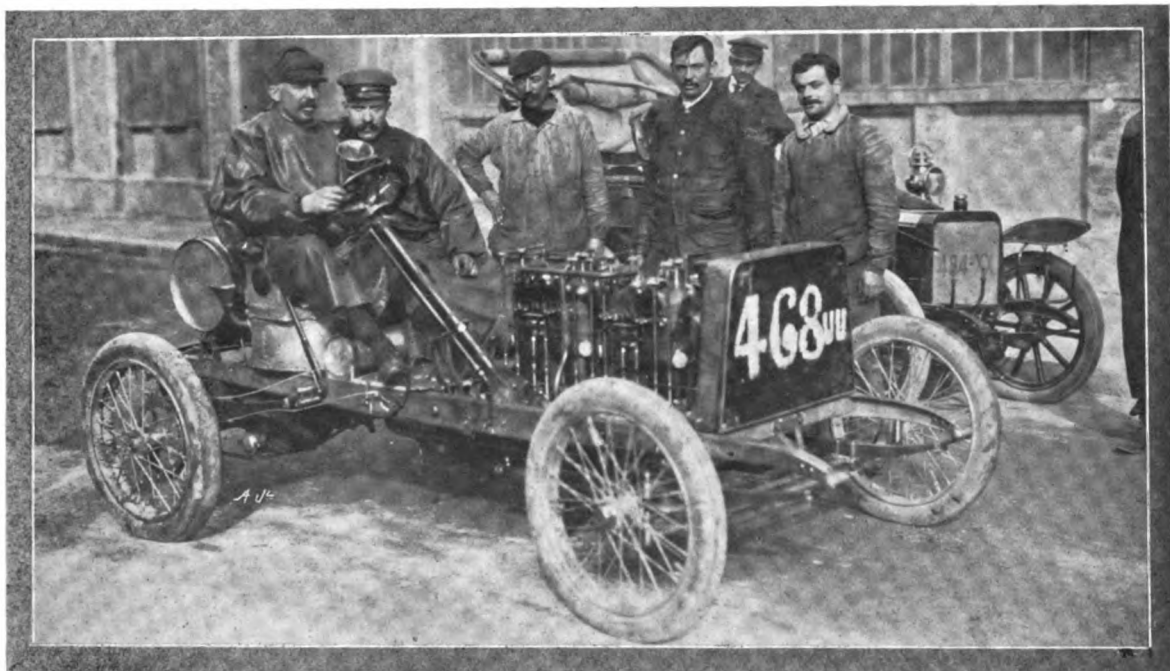
THE first of the German Mercedes cars was last week completed, and has been in the hands of Baron de Caters for testing. The two sister vehicles will not be completed until after these tests have been found satisfactory. We are able this week to give a photograph of this first machine issued from the Cannstatt factory.

It is authoritatively announced that the drivers of the German and Austrian Mercedes cars will be as follows :—

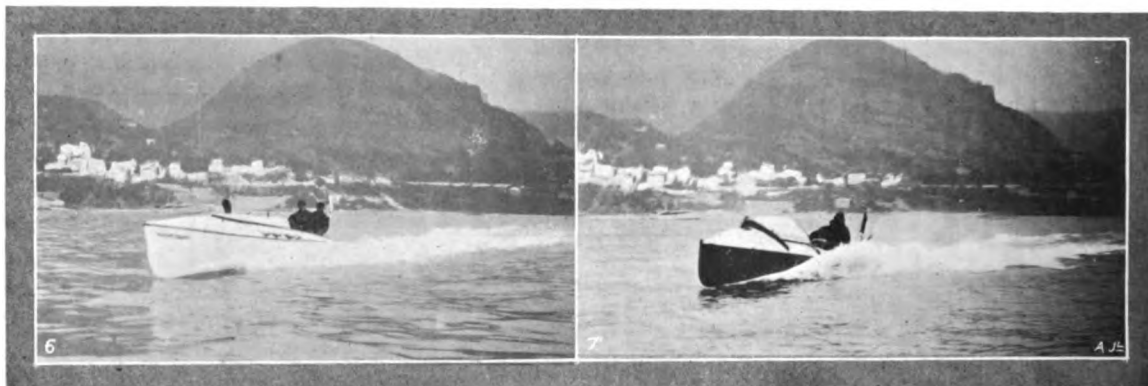
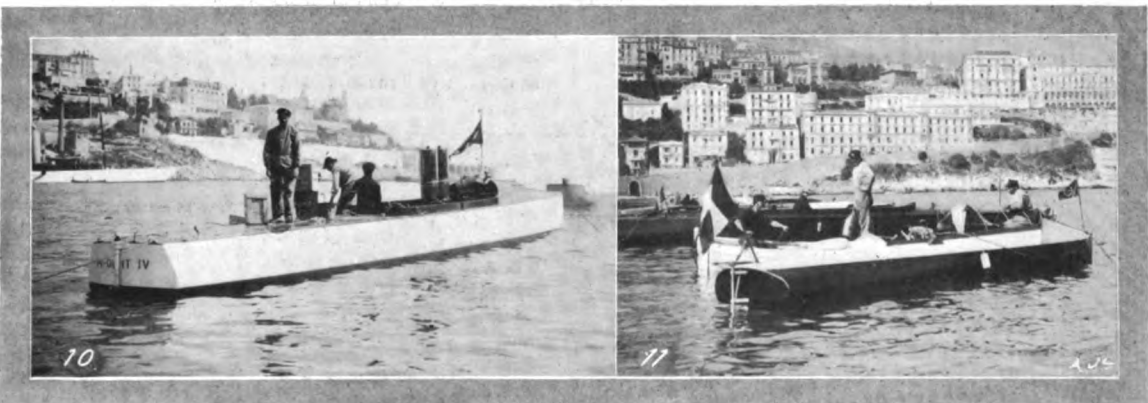
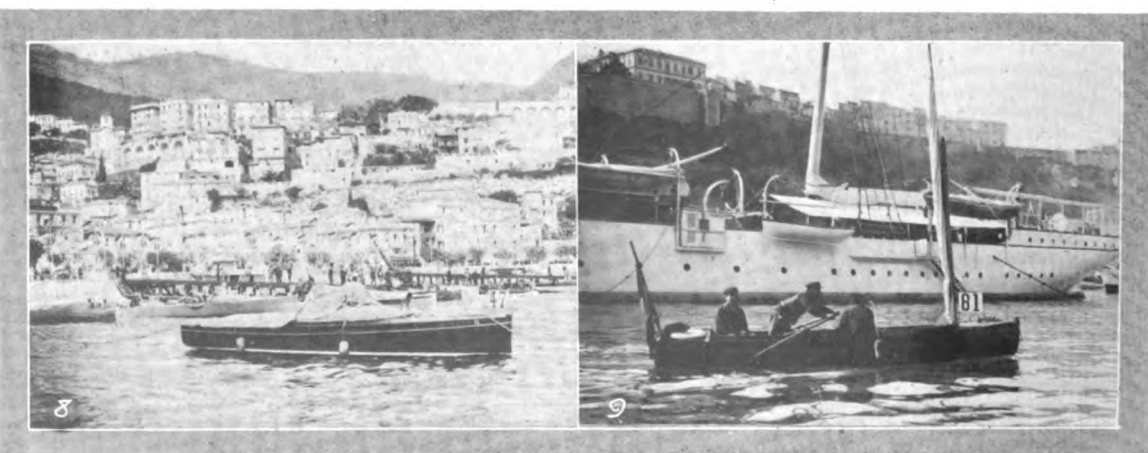
- For Germany : Jenatz, de Caters, and Salzer.
- For Austria : Braun, Hieronymus, and A. Burton.

IN regard to the British drivers in the Selection Trials in the Isle of Man we have received the following official communication from the A.C.G.B.I. :—

"IN view of Messrs. Bianchi and Lisle, two of the nominated drivers in the Eliminating Trials for the Gordon-Bennett Race to be held in the Isle of Man, having been summoned to appear before the magistrates, and in each case having been convicted of driving to the common danger, the Committee of the Automobile Club of Great Britain and Ireland has summoned them to appear at its next meeting on Thursday, the 27th April, to show cause why they should not be struck off the Competitors' Register."



One of the Darracq Racers, which is to take part in the French Eliminating Trials, with De la Toulourbe—the selected driver—at the wheel. This car, which weighs 750 kilogs., has a 4-cylinder 85-h.p. engine, in which all the valves are mounted above the cylinder-heads. The bore and stroke of the cylinders are 160 mm. and 140 mm. respectively, the gear-box forms a part of the "live-axle" casing, and the wheel-base is about 7 ft. 6 in.

**"Mercedes-Charley" at full speed.****"La Rapiere" turning at full speed.****"Fiat X."****"Billancourt." "Panhard-Levassor."****"Pi-Oult IV."****"La Rapiere."****"Mets-y-En II" (Cruiser).****"Héracles III" (Fishing Boat).**

MONACO MOTOR BOAT MEETING.—Some of the Chief Competing Craft.

THE THORNYCROFT LURRIES, OMNIBUSES, AND VANS.—PART VII.

THE front axle, which is a solid forging, is of much the usual construction, with steering-heads at both ends, but the back axle is of the "live" type, with its axle-boxes connected to the frame by adjustable radius rods. In order to economise space, the steering-gear is placed quite in the front of the frame, the steering-pillar passing alongside the engine and through the dashboard at a

The design of the gear-box is based on the usual well-known "Mercedes" lines, and it has a transverse countershaft, which is driven by bevel-gearing from the second-motion-shaft. The countershaft is, however, a solid shaft, since no differential-gear is needed for it, and it: two ends merely project short distances on either side of the gear-box. On the left end, is fixed a sprocket-wheel

from which the chain passes to the back axle, and, on the right end, is secured a brake-drum that is acted upon by the brake-pedal. The change-speed-gear has its sliding spur-wheels mounted on the first-motion-shaft, and this shaft lies immediately above the second-motion-shaft. The various changes of speed are made by a single lever, placed to the left of the driver, and arranged so that it can be moved backwards or forwards in either of three alternative, parallel slots. The

four forward speeds provided represent $3\frac{1}{2}$, $5\frac{1}{2}$, $8\frac{1}{2}$, and 12 miles per hour respectively, when the engine is running at 900 revs. per min., and the "reverse" is the same as the "first" speed. The entire gear runs in oil in a dust-proof casing, and the gear-wheels—which are of large size—are made of hardened mild steel.



A Standard 24-h.p. Single-deck Thornycroft Omnibus, now in use at Hastings.

very acute angle. The rod connecting the worm-and-sector gear with the steering-heads, therefore, lies transversely, instead of longitudinally.

There is a separate under-frame, formed by two inner longitudinal members, for carrying the engine and the gear-box, which are situated at quite a considerable distance apart, and have a flexibly-coupled shaft connecting them together. The engine occupies the usual position beneath the bonnet, but the dashboard, instead of being quite behind the engine, is brought sufficiently forward to bridge over the rearmost cylinder; the front of the bonnet is formed by a radiator built up out of finned tubes, with a belt-driven fan to draw the air through it. The engine has a low-tension magneto-system of ignition, a gear-driven circulating-pump, and a special "automatic" carburettor.

The external appearance of the clutch employed on these and all other Thornycroft petrol vehicles is shown in Fig. 12, where it will be noticed that the oil-tight drum, that contains the inter-meshing metal discs, forms a part of, and projects rearwardly from, the flywheel. It is more or less of the Hele-Shaw type, and is also in general respects similar, in the principle upon which it works, to the Bradley clutch, which was described by us recently. The plates are normally forced up together by the usual main clutch-spring, and are provided with small independent springs for separating them individually when the pressure exerted by the main-spring is relieved. Running in oil, the discs cause the clutch to have a very smooth and progressive action, so that it—in conjunction with the "spring-drive" device on the road wheels—prevents the vehicle from being started too suddenly from rest.

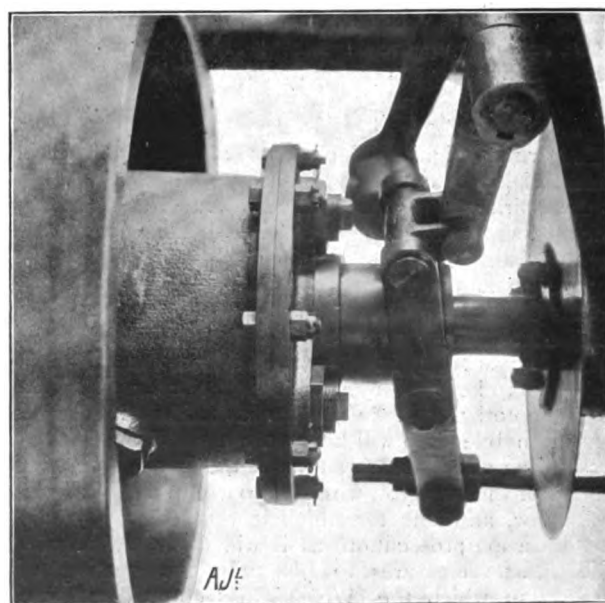


Fig. 12.—View showing the external appearance of the multiple-disc main clutch which is employed on all the Thornycroft petrol vehicles.

The vehicle has a wheel-base of 12 ft. 9 ins., a track of 5 ft. 6 ins., an overall width of 6 ft. 6 ins., and the wheels are of the artillery type with metal naves, oak spokes, and ash felloes. The solid rubber tyres are 3 ft. 3 ins. in diameter, single on the front wheels, and in pairs on the driving wheels. In addition to the foot-brake, above referred to, there is a powerful hand-brake acting direct on the shell of the differential-gear on the back axle, the lever operating this being placed outside the driver's seat. The petrol tank has a sufficient capacity for running about 75 miles without re-charging, and the radiator renders the loss of water in the cooling system extremely small.



Fig. 13.—The Thornycroft 2-ton Petrol Lorry, which has a single-chain drive to the live-axle, and is equipped with a 20-h.p. 4-cylinder engine.

The Thornycroft Petrol Luries.

The petrol luries made by the Company, at present, include those intended to take loads of two tons, and those built for loads of one ton, but they also have in hand a lighter commercial vehicle, which is being specially designed for such commercial work as involves carrying a useful weight of about 10 cwt. One of the 2-ton wagons is shown in Fig. 13, from which it will be recognised that—except for the substitution of steel tyres for rubber tyres, and for the shortening of the wheel base—it differs but little in external appearance from the standard 'bus chassis already dealt with. The arrangement of the transmission mechanism is in all important respects identical, but, instead of having the new 24-h.p. engine, the Thornycroft Company's better-known 20-h.p. engine is substituted, and, instead of having a side-lever to operate the brake on the back axle,

there is a screw-down hand-wheel. The 20-h.p. engine is of the 4-cylinder type, with bore and stroke of 4 and 4½ ins. respectively, and its cylinders are cast in pairs. The chassis has a standard wheel-base of

10 ft. 1¼ ins., a track of 5 ft. 6 ins., the driving wheels are 4 ft. in diameter, and the steering wheels 3 ft. 3 ins. in diameter with 4-in. faces; the length available behind the driver's seat is about 6 ft. The vehicle is geared to run at normal speeds of from 2½ to 10 miles an hour, and is capable of carrying its full load up a gradient of about 1 in 10, on ordinary roads.

The standard one-ton chassis has the same 20-h.p. 4-cylinder engine, but is of an altogether lighter, and different, design. It is primarily intended for motor tower-wagons, but is also fitted with bodies of various kinds for different purposes. The vehicle built for the British Vacuum Cleaner Company, of which we gave an illustration on March 25th last, is an instance in point. The chassis also lends itself well to the construction of speedy delivery vans. It has a wheel-base of 10 ft. 6 ins., a track of 5 ft. 4 ins., an overall length of 14 ft. 7 ins., and its wheels are usually shod with 34-in. solid rubber tyres—twin tyres on the driving wheels. The engine and the gear are carried on an under-frame, with the multiple-disc main clutch between them, but the gear-box is of the type usually employed on live-axle vehicles, and there is a differential countershaft which drives the road-wheels through spur-gearing. The gear provides four forward speeds and a reverse, the top speed being equivalent to about 14 or 15 miles per hour, when the engine is running at 900 revs. per min.



THE rural dignitaries of Sussex have from time immemorial been celebrated for their conspicuous want of the spirit of modern progress and intellectuality generally, so that it does not come as much of a surprise that the chairman of the Parish Council of Wivelsfield proposes to combat the motor car movement, to which he and his Council are strenuously opposed, by instructing the district surveyor "to place from time to time" (the phraseology is good) finely crushed flints on the roads it is his duty to keep in order, the object of course being to induce motorists to take another direction. We trust the Automobile Club will keep an eye on Wivelsfield, as the carrying out of such a suggestion, either by its Parish Council or the surveyor, would of course be an infraction of the law, and one for which it would be a pity they should escape prosecution, as it will evidently require some drastic measures to penetrate the coating of stupidity in which the Wivelsfield "councillors" are encased. One of the councillors declared that only old, stone-deaf, and totally blind horses could ever be got to pass motor cars. Perhaps if someone would give the



Wivelsfield councillors a few lessons in the art of driving horses they would be distinctly benefited by it. Another Wivelsfield councillor is even more drastic, and wishes to hang all the motorists he can lay his hands on!

THE suitability of motor power for the propulsion of what may be described as "house-boats on wheels," and the charm of the method of travel these provide, is receiving special recognition in France, by the foundation of a "Home-Car Club de France." A "home-car" is described as being a car in which one is always at home, that is to say, it is a big affair, comprising spacious sleeping accommodation, portable kitchens, and all the rest of it. The new club, which has been organised by Baron de Senneroy, a prominent devotee of home-carism, has issued a manifesto setting forth the delights of the vagrant life on wheels, and appealing for general support and membership. Baron de Senneroy's own "home-car," in which the new club had its birth, is an imposing edifice on wheels, weighing altogether some 5 tons.

THE LATEST CLARKSON STEAM 'BUSES.

(Concluded from page 509.)

The Feed Pumps.

ALL four pumps are precisely similar, are of very simple construction, and have interchangeable parts; the following description of the lubricating-pump is therefore applicable to the other pumps as well. This pump is shown in Fig. 8, with the pump-barrel, G, sufficiently

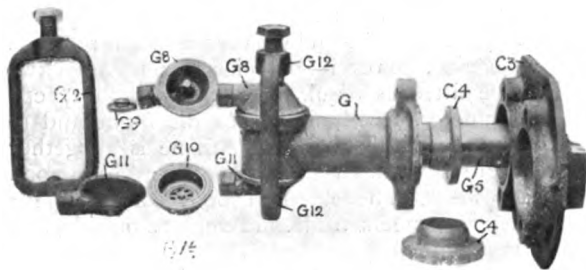


Fig. 8.—One of the Clarkson feed-pumps, partly removed from its pump-plate, C³, to show the hydraulic joint ring, C⁴; also views of the pump-valves, and of a joint-ring, C⁴, separately.

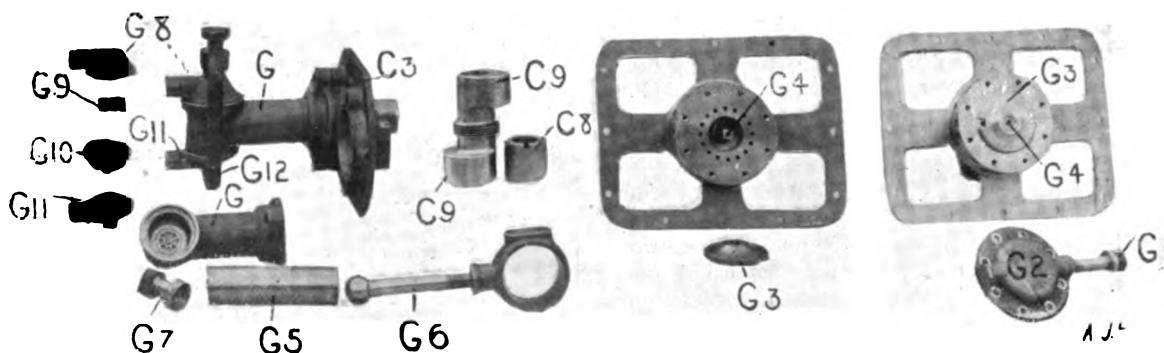


Fig. 9.—One of the Clarkson feed-pumps fitted to its pump-plate, with a pump-cylinder, G, a piston, G⁵, a piston-rod, G⁶, a pair of eccentric-blocks, C⁹, and a set of pump-valves arranged alongside it. To the right, are two views of the 16-feed distributor for the lubricating-oil, showing the revolving disc-valve, G³, both detached and in place, and showing the cover, G², of the distributor, separately.

removed to show the hydraulic joint-ring, C⁴, which is one of its most important characteristics. The pump is also illustrated in Figs. 9 and 10; in Fig. 9 the various parts are also shown separately, and Fig. 10 is a sectional drawing which explains the entire construction. The pump-barrel, G, and the plunger, G⁵, are made of phosphor-bronze, and, instead of an ordinary stuffing-box—which requires tightening occasionally to prevent leakage—there is a joint-ring, C⁴, which is held in place between the pump-barrel, G, and the pump-plate, C³. The material of which this ring is made is equally impervious to water, to paraffin, and to lubricating oil, and it fits closely around the plunger, as seen in the illustration. These joint-rings are found to last a considerable period before they begin to leak, and it will

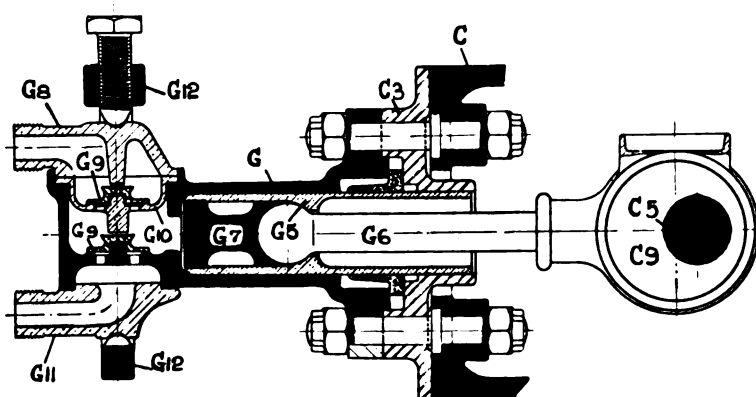


Fig. 10.—Longitudinal section through the Clarkson feed-pump, fixed in place, by means of its pump-plate, C³, to the casing, C², that encloses the differential countershaft, C¹.

G¹⁰, at the same time that it forces down the delivery-pipe connection, G⁸, from above. The valve-seating, G¹⁰, receives the delivery-valve, in just the same way that the suction-valve is received, by a seating forming part of the main casting below it, and both these valves, G⁸, are

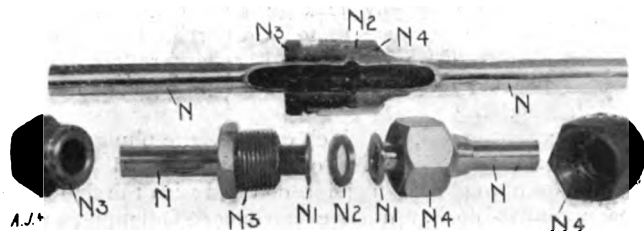


Fig. 11.—Views showing the special pipe joint employed on the Clarkson Steam Car.

normally kept on their seats by gravity only. The valves are, however, prevented from lifting too far by spigots, which project down from the casting, G¹⁰, and from the pipe-fitting, G⁸, respectively. By this very simple construction, the valves are rendered capable of working at high speeds.

In Fig. 9, the oil distributor is shown with the rotating valve, G³, removed from its spindle, G¹, and also, in another view, with this valve in place. The valve rotates inside the chamber formed by the cover, G²—which is bolted to the main distributor casting—and the oil is delivered into the cover, G², through the pipe, G¹. As the valve, G³, rotates, it opens up each of the 16 holes that lie beneath it, in turn, and so the oil is made to flow down each of the feed-pipes (not shown) to the various parts of the engine. The valve, G³, uncovers a fresh hole before it has covered up the previous one, and it revolves at such a speed that the pump makes two or three delivery strokes during the time that each hole remains open. It will be understood that the oil pump

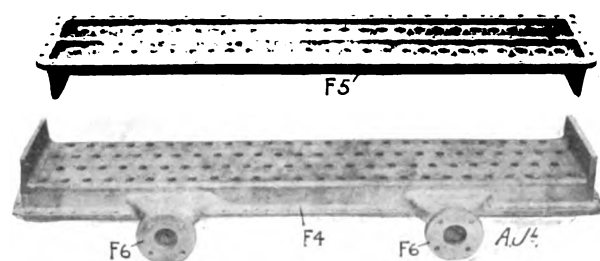


Fig. 12.—Top and bottom header castings for a Clarkson condenser.

takes its supply from the pipe, G¹³ (Fig. 5), in the base of the crank-chamber, and that the oil again finds its way down into the base casting, B¹.

The Pipe Connections.

The very effective joint shown in Fig. 11 is employed on these cars for connecting one pipe with another. It is not only an easy joint to make, but is one which will stand as much pressure as the pipe itself, and entirely overcomes the difficulty that is sometimes experienced owing to the mechanical weakness of joints that are subjected to any vibration. The two ends of the steel pipe,

N, are flanged over at N¹, so that the two portions, N² and N⁴, of the union can be made to pull them up tightly together against the copper ring, N³, that is fitted in between them. The union nuts support the pipe for quite an appreciable distance on either side of the joint, and the copper ring—being soft—enables a thoroughly tight joint to be ensured.

The Double-Deck 'Buses.

The larger chassis, which is now being built to take omnibus bodies of greater carrying capacity than before, is, as we have already said, of very different design in many important respects. The engine, however—of which either one or two can be fitted as required—is mounted in exactly the same way with regard to the frame and to the transmission-gear, but the frame is altogether of more substantial construction, and is a good deal wider. The standard body has seats for sixteen passengers inside, and eighteen outside, and the roof is extended forward above the driver's seat, as seen in the illustration already given. With a wheel-base of 11 ft. 6 ins., and a track of 5 ft. 9 ins., the available space behind the boiler-casing is 11 ft. 6 ins., and the overall width comes within the 7 ft. 6 ins. regulation limit. The top of the frame is 31 ins. above the ground, and the front and rear wheels have 34 and 40-in. tyres, respectively; the tyres are of the solid rubber type, 4 ins. wide, and there are a pair on each of the driving-wheels.

Of the steam generator, we are unable at present to give very full particulars, and of the complete system that

Table of Reference Letters for the Clarkson Steam Car Illustrations.

A	Cylinders.	F ³	Radiator.
A ¹	Steam-pipe connections.	F ⁴	Lower header casting.
A ²	Exhaust-pipe connections.	F ⁵	Upper header casting.
A ³	Exhaust connection between cylinders.	F ⁶	Steam pipe connections.
A ⁴	Crosshead guides.	G	Lubricating pump.
A ⁵	Inner cylinder covers.	G ¹	Delivery-pipe to distributor.
A ⁶	Packing sleeves for piston-rods.	G ²	Cover-plate of distributor.
A ⁷	Springs for A ⁶ .	G ³	Distributor-valve.
A ⁸	Piston-valves.	G ⁴	Spindle for same.
A ⁹	Pistons.	G ⁵	Pump-plunger.
A ¹⁰	Crossheads and piston-rods.	G ⁶	Plunger-rod.
A ¹¹	Connecting-rods.	G ⁷	Plug for same.
A ¹²	Piston-rings.	G ⁸	Delivery-pipe fitting.
B	Crank-chamber casting.	G ⁹	Delivery-valve.
B ¹	Base of crank-chamber.	G ¹⁰	Seating for delivery-valve.
B ²	Cast-iron bed-plate.	G ¹¹	Suction-pipe fitting.
B ³	Crank-shaft.	G ¹²	Bridge.
B ⁴	Spur-wheel on crank-shaft.	G ¹³	Suction-pipe for oil in crank-chamber.
B ⁵	Countershaft casing-castings.	H	Differential-gear castings.
C	Inspection-cover above cylinder-lubricator.	H ¹	Spur-wheel fixed to same.
C ¹	Inspection-cover above lubrication distributor.	J	Throttle-valve hand-wheel.
C ²	Pump-plates.	J ¹	Throttle-valve.
C ³	Hydraulic joint rings.	J ²	Additional throttle-valve.
C ⁴	Differential-shafts.	J ³	Steam-pipe connection on boiler.
C ⁵	Spur-wheels formed with same.	J ⁴	Steam-pipe to engine.
C ⁶	Thrust-collar between same.	K	Boiler-shell stampings.
C ⁷	Bushes fixed to C ⁶ .	K ¹	Water gauge-glass.
C ⁸	Eccentric blocks.	K ²	Safety-valves.
C ⁹	Water-tank.	K ³	Steam-pressure gauge.
C ¹⁰	Filler for same.	K ⁴	Try cock.
C ¹¹	Water-feed-pump.	K ⁵	Blow-off-valve.
C ¹²	Auxiliary feed-water hand-pump.	L	Reversing lever.
D	Shut-off valve for same.	L ¹	Rock-shaft for reversing-gear.
D ¹	Feed-water check-valve.	L ²	Levers-arms fixed to L ¹ .
D ²	Fuel-tank.	L ³	Links operated by L ² .
D ³	Filler for same.	L ⁴	Pivoted guide-blocks.
D ⁴	Fuel-feed pump.	L ⁵	Castings carrying L ⁴ .
D ⁵	Pressure-drum for fuel.	L ⁶	Operating-rods for piston-valves.
D ⁶	Starting fan for burner.	L ⁷	Links from fixed fulcrums.
D ⁷	Fuel regulator handle.	L ⁸	Castings carrying fulcrums.
D ⁸	Fuel pressure-gauge.	M	Brake-pedal.
D ⁹	Fuel-lock lever.	M ¹	Brake-lever.
D ¹⁰	Electric pyrometer.	N	Steel pipes.
D ¹¹	Condensed-water pump.	N ¹	Flanged ends.
D ¹²	Filler for water tank.	N ²	Copper ring.
D ¹³	Exhaust-steam pipe.	N ³	Male union nut.
		N ⁴	Female ditto.

is employed in conjunction with it, we are not at the moment permitted to say very much. The generator, however, is of the semi-flash type, contained in a sheet-nickel casing beneath the driver's seat, and there is no chimney as on the smaller car. The exhaust gases from the burner pass through a down-flue, instead, and emerge beneath the car. Concerning the system, one of the special features is that an electric pyrometer is provided in order to indicate to the driver the temperature of the steam issuing from the generator, so that he may control the burner to suit the temperature as well as the pressure of the steam. In Fig. 13 we give a view of a partly finished dial-board for one of the new 'buses, where it will be seen that between the pressure-gauge, E⁶, for the fuel, and that, K³, for the steam, is the pyrometer, E⁸. Below the dial-board, there will be, as indicated, four neatly arranged control levers, one for the main-oil feed-valve, one for the valve between the pressure tank and the burner, one for controlling an auxiliary feed-water steam-pump, and one for the steam blast fitted in the down flue.

The casing that encloses the differential countershaft on this car is so made that either one engine or two engines can be bolted to it, and the vehicle can thus be made suitable either for comparatively level town use, or for employment in hilly districts. On this car, too, there is a fan mounted behind the condenser in front, for assisting in keeping it cool, the fan being driven by a chain and by bevel-wheels from the countershaft. The condensers employed on all the "Chelmsford" vehicles

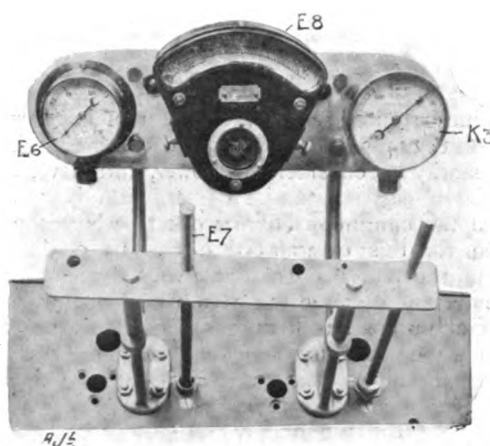


Fig. 13.—View of a partly-finished dial-board for one of the new double-deck Clarkson 'buses.

are built up of tubes of the well-known "Clarkson" type, these being fixed by threaded ferrules at each end into the aluminium headers. The upper and lower header castings for the 4-cylinder double-deck 'bus are shown in Fig. 12, where it will be noticed that the exhaust steam from the two engines enters the lower casting, F⁴, through the passages, F⁶, and that it is caused to ascend and descend twice—through the four rows of tubes—in succession.



Tilling's Motor 'Buses a Success.—Some interesting remarks as to the introduction of motor omnibus traffic were made by the chairman at the meeting of Thomas Tilling, Limited, last week. He said that the experiments which had been made had proved so satisfactory as to warrant a continuance, and, as far as could be judged at present, motors were likely to pay well. In spite of rate-supported trams, Mr. Tilling thought the outlook for the omnibus trade was never brighter than it is to-day. He informed the shareholders that the company had secured the contract with the Postmaster-General for the carriage of parcels to Brighton by motor traction, and that this arrangement would come into force on June 1st.

MR. W. E. ROWCLIFFE, solicitor, of Manchester, well known in automobile circles, has been the victim of a deliberate assault by a horse driver, who not only attempted for some time to block the road on which Mr. Rowcliffe was travelling by turning his horse and cart across it, but on one occasion deliberately drove his trap into Mr. Rowcliffe's car, and damaged the motor, which was very nearly overturned. Mr. Rowcliffe ultimately followed the defendant to get his name and address, whereupon the truculent hippomobilist stood up in his trap and lashed him about the face and body severely with his whip. Mr. Rowcliffe explained to the bench of magistrates by whom the charge of assault was tried that he brought the proceedings in the interests of motorists generally, but all that the owner of the horse-drawn vehicle was fined for his disgraceful behaviour was £3. Had the boot been on the other leg, and the assault committed by an automobilist, one trembles to think of the penalty that would have been inflicted upon him.

THE enemies of the automobile movement appear to be getting more and more hard up for arguments, or rather we should say excuses, for their opposition, and exceedingly funny reading some of them make. An instance in point is provided by the recent report of the Westminster City Engineer to the Council. After repeating the old libel that motor cars disintegrate macadam roads, this eminent official actually asserts that the rubber tyres of motor vehicles *suck the creosote out of wooden paving*, and so reduce the preservative action of the creosoting! We trust that Parliament may not be induced to make a special offence, when the next Motor Car Act is passed, of sucking creosote out of the streets!

THE automobile has widely demonstrated its applicability to the purposes of a travelling car of what may perhaps be called the road houseboat type, and automobile travelling post offices have, as our readers will remember, recently been inaugurated in the Isle of Wight. It is to America, however, that we must look for one of the most recent applications of the automobile, a New York pawnbroker having had built for himself a travelling pawnshop propelled by motor power, which consists of a big red motor car adorned with the traditional three golden balls. The object of the pawnbroker is, as he says, to come to the relief of broken-down sporting gentlemen, and also to turn, of course, a moderate profit for himself. Mr. Abrahams, the pawnbroker in question, knows from painful experience the plight of the man who loses his all, say, at a race course and is obliged to walk home. The travelling pawnshop, with £10,000 capital, will meet cases of this kind, and, its promoter thinks, fill in other respects a long felt want.

THE WOLSELEY INDUSTRIAL VEHICLES.

(Concluded from p. 506.)

Petrol Railway Coaches.

THE engines required for the propulsion of independent coaches on the branch lines of some of the great railways are necessarily of considerable power, and have, moreover, to be of very substantial construction in order to withstand the continuous hard work to which they are subjected for this commercial duty. In conjunction with them, the Wolseley Company very strongly favour the employment of an electric transmission system for this special purpose, as it affords a convenient method of applying the power to more than one set of wheels—thus obtaining the necessary traction—and it also enables the relative speeds of the engine and of the coach to be varied without the use of any clutches or complicated mechanical gearing. The two coaches which have for

450 revs. per min., has four horizontal cylinders of 8½-in. bore by 10-in. stroke. Two of the cylinders are fixed on the one side of the crank-chamber, and the other two on the opposite side, while the inlet-valves—above the cylinder heads—and the exhaust-valves—beneath them—are operated by a cam-shaft that lies along each side of the crank-chamber. The engine is coupled direct to a Westinghouse dynamo, the current from which is led through the speed controller to the motors on the bogies. These coaches weigh about 35 tons each, and are capable of maintaining an average speed of 30 miles an hour.

The larger engine to which we have above referred, will be described fully by us as soon as it is completed, but in the meantime we may mention that it is of

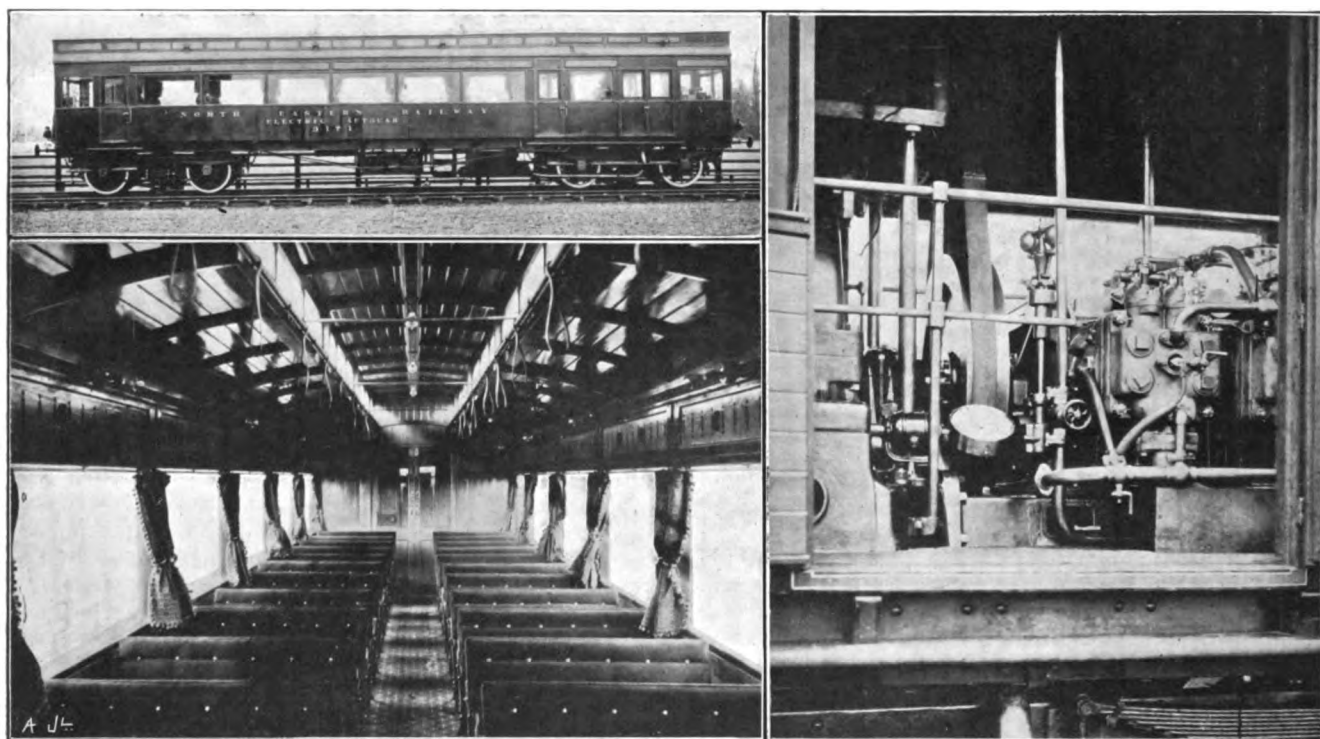


Fig. 7.—Exterior and Interior Views of one of the North-Eastern Railway Company's Petrol Motor Coaches, together with a view of the Wolseley Engine by which it is propelled.

some time now been running most successfully on the North-Eastern Railway have amply demonstrated the merits of the Wolseley petrol engines, and of the electric transmission system, while, at the present time, these makers are turning out an even larger engine than that previously employed, and are supplying it for use on one of the large railways in America. On January 23rd of last year, we were able to give an illustrated description of one of the combined engines and dynamos built for the North-Eastern Railway coaches, so that it is unnecessary to more than recapitulate a few of the leading characteristics; we now, however, give (Fig. 7) an exterior and an interior view of one of these coaches, together with another view in which a portion of the driving mechanism is shown. The engine, which is nominally of 90-h.p. and runs at a normal speed of

considerably greater power—nominally of 140-h.p.—for it has six cylinders of 9-in. bore and 10-in. stroke, three arranged horizontally on each side of the crank-chamber. Its general construction follows closely that of the 90-h.p. model, though in many respects important improvements have been made, and an extremely complete balancing has been rendered possible owing to the employment of six cylinders instead of four. It has a nickel steel crank-shaft that is 4 ins. in diameter, and the lubricating oil is forced direct to the four main bearings, while an unusual feature of the engine is that the cam-shafts are provided with flywheels to improve the steadiness of running, and to equalise the wear of the gear wheels which drive them.

For railway work of this nature, these large Wolseley engines are particularly applicable, for not only are all the

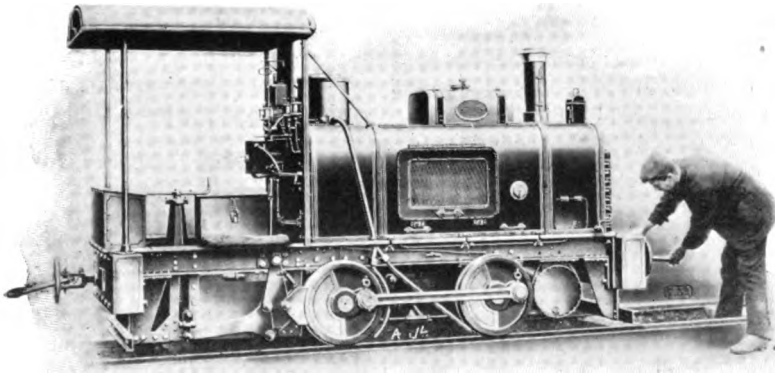


Fig. 8.—A Wolseley Petrol Locomotive for haulage and shunting work on narrow-gauge railways.

moving parts unusually accessible for inspection or renewal at any time, but they lend themselves well to the somewhat confined space that is available for them in a coach of this character. It is probable, in view of the very satisfactory nature of the results obtained by the North-Eastern Railway Company, that several other railways will follow their lead, and that this important branch of the Wolseley Company's business will assume very large proportions in the near future.

Light Petrol Locomotives.

The small locomotive shown in Fig. 8 has been designed for use on narrow gauge railways, for haulage work of all kinds, for factory use, and for the innumerable similar purposes where such a machine would prove invaluable. At first glance it looks like a steam engine, because the engine is enclosed beneath a bonnet, and because there is a funnel through which the exhaust-gases are allowed to escape to the atmosphere, to create a draught through the radiator. The petrol engine employed is of the twin-cylinder 20-h.p. horizontal type that we have already described in conjunction with the Wolseley motor 'buses, and this is rigidly fixed to the channel-steel main-frame, with its shaft lying transversely and its cylinders projecting rearwardly.

The power is transmitted by a "silent" chain from the crank-shaft to the first-motion-shaft of the change-speed-gear, which can be made to give two speeds in either direction, and there is a main-clutch of the usual cone type, fitted upon the projecting end of the first-motion-shaft. The gear-box rides at its rear end, on the axle that is nearest to the driver's cab, and it is, at its other end, connected by a hinged link with the main-frame. Both axles work in

horn plates, and have helical springs introduced between the axle-boxes and the frame. The four wheels are coupled together by external connecting-rods, as seen in Fig. 8.

The change-speed gear has two second-motion-shafts which are connected together by a pair of spur-wheels, and both these shafts have two sliding-spur-wheels mounted upon them in such a way as to engage alternatively with corresponding wheels on the first-motion-shaft.

One of the second-motion-shafts carries a pinion that is at all times in mesh with a corresponding spur-wheel on the axle, and the other second-motion-shaft merely acts as an intermediate shaft for enabling the "reverse" speeds to be obtained.

The particular locomotive from which our illustration was taken, weighs about three tons in full working order, and is capable of hauling a load of about fifteen tons. It has a 2 ft. 9½-in. gauge, with 18-in. wheels, and is geared to run at speeds of up to about 10 miles per hour. All four wheels are provided with brake-blocks that can be simultaneously applied by screwing down the brake handle, and, in order to enable it to haul its load over a slippery road in either direction, a sand box—mounted above the bonnet—is connected by pipes with all four wheels. The usual fittings and regulating levers are conveniently arranged alongside the driver's seat in the cab, and there are draw-bar couplings attached centrally to the main-frame at each end. The forced draught created by the exhaust blast has been found amply sufficient to keep the circulating water cool, in practice, and, since the gases are first led through a silencer, the engine runs comparatively quietly.

Table of Reference Letters for the Wolseley Industrial Vehicles.

A Crank-chamber.	C ² Hand-lever for hub brakes.
A ¹ Flywheel.	C ³ Shoes for countershaft brakes.
A ² Cylinder heads.	C ⁴ Pivoted levers operating same.
A ³ Carburettor.	C ⁵ Compensating cable for same.
A ⁴ Throttle-lever.	C ⁶ Rock-shaft.
A ⁵ Water-tank and radiators.	C ⁷ Hand-lever for countershaft brakes.
A ⁶ Petrol tank.	C ⁸ Brake-drum on second-motion shaft.
A ⁷ Exhaust-box.	C ⁹ Pedal for same.
A ⁸ Timing-lever.	D Fuel-valve.
A ⁹ Commutator.	D ¹ Air-valve.
B Gear-box.	D ² Admission port to D.
B ¹ Main clutch.	D ³ Adjustable ditto to D ¹ .
B ² Clutch pedal.	D ⁴ Fuel ports in valve seat.
B ³ Renold's silent chain.	D ⁵ Mixing plug.
B ⁴ Second-motion shaft.	D ⁶ and D ⁷ Annular hot chambers.
B ⁵ Gear-lever.	D ⁸ Passage to induction pipe.
B ⁶ Adjustable connecting rod for same.	D ⁹ Admission port for hot gases.
B ⁷ Rock-shaft carrying Quadrant.	E ¹ Central exhaust gas chamber.
B ⁸ Cam-shaft in gear-box.	E ² Exit for exhaust gases.
B ⁹ Springs for radius rods.	E ³ Blow-lamp chamber.
C Expanding shoes for hub brakes.	
C ¹ Rods operating same.	



MR. EMILE OPPERMAN, driving an electric car, had the misfortune recently to run over and kill a clerk named Thomas Grimble, in the Vauxhall Bridge Road. From the evidence given at the inquest, it was quite plain that the occurrence was the purest accident, and Dr. Webb, of the Westminster Hospital, where Grimble expired, declared that his death was due to *delirium*

tremens. Nevertheless, the jury's verdict was "Death by being knocked down by a motor car which could have been avoided if the driver had applied the brake promptly." Let everyone be careful, therefore, not to be knocked down by a motor car whose driver is slow at applying the brakes, for if he is he will probably get *delirium tremens and die!*

"IS ELECTRIC TRACTION PLAYED OUT?"

By an Electrical Engineer.

WE are slow to change, and have a tendency to run in grooves, and it would appear that all great improvements have resulted from the labours of some pioneer who did not attempt merely to deepen existing ruts, but commenced a new one.

Earlier, the process of change worked simply, only hampered by the groove tendency noted. But later, vested interests, antagonistic to any new departure, became the chief enemies of progress; although at first glance it would appear that huge accumulations of capital would be inclined to exploit inventions of benefit to civilisation, the opposite is in reality the case. And, in one way, this is obvious. Capital invested in machinery for turning out chopsticks is not likely to encourage the introduction of forks.

It is a common thing to hear men of undoubtedly keen foresight in other directions say, "Electricity is the coming thing." Certain "Correspondence Colleges" in effect utter the same cry. One even goes so far as to urge men to "Get away from the crowd" by becoming electrical engineers. In some way the idea seems to have gained credence that there is a dearth of electricians, that it is difficult to get hold of a good man, that pay is high, and that a man with a thoroughly good knowledge of electric lighting, power, or traction, can practically command his own price.

This is not so.

There are to-day a larger number of clever electrical engineers out of a post, or occupying a subordinate position, than there are positions of importance to fill. I do not know that any other profession is so overcrowded. For every opening there are literally hundreds of applicants, and every day sees additions to their number. Pupils, apprentices, men with a correspondence-college "training" and a splendid optimism, are entering, or endeavouring to enter, the ranks.

If the present openings were, let us not say doubled, but quadrupled, there are to-day sufficient capable men to fill them.

But can these openings be increased to any extent? I have no hesitation in saying, and I have given a great deal of thought to the matter, that electrical engineering as a profession—at the present time—is as decrepit as the cycle trade. Vested interests will come largely into play to prolong its life, and to a certain extent they will succeed in putting back the clock, but apart from the power possessed by municipalities and power companies, I see nothing to justify the optimism of those who persuade parents and guardians that electricity will be the power of the future.

The electrician, also, is merely a growth—to a certain extent we may say a parasitic growth—on the engineering tree. His real term of life will be determined by the fighting power of the above-mentioned corporations and companies. His profession at the present time, even, is one of the worst paid and least alluring, and is steadily becoming lower both in status and reward.

But I do not wish to be misunderstood. I see nothing at present to oust electricity from lighting, while telephony and telegraphy will probably hold their own, and even develop. Beyond this I see little or nothing for which it will continue in use, either from a commercial or artistic standpoint. It will not do so for heating (which is not taken seriously by any electrician), nor on any great scale for power.

It is in the vested interests of the present tramway owners, and of the railway companies that are, or are about to be electrified, that there lies the lease of life of electricity as a power.

It is curious to note that the groove tendency will assist in fighting these last supporters of the electrical engineer. It is at present impossible, broadly speaking, to find a town of about 5,000 inhabitants which has not already been granted, or at least applied for, a Provisional Order to enable electric lighting plant to be laid down. Yet it is, I understand, capable of demonstration that such a plant, unless under exceptional conditions, and run in conjunction with a refuse destructor, will not pay. Now other existing methods of refuse disposal are in use, and this will tend to prevent the destructor idea from being introduced, so that chances of profit from the electrical plant will be small. The result will be that other means of power will be tried, experimentally at first, but with continued improvements, in these smaller towns, to finally invade the larger districts where the company or corporation is working at a profit, enter into fierce and eventually successful competition, and the electrical engineer will exist just so long as the shareholders or ratepayers continue the fight.

Practically some form of the internal combustion engine, at present generally (from the usual source of power) called the petrol engine, which I may mention has already proved itself efficient in the form of oil and gas engines, will be chiefly instrumental in bringing about the *débâcle* of electricity. Other factors will enter into the struggle, but the light and efficient prime mover, actuated directly by some safe and powerful fuel, will, by reason of its many advantages, drive the electric motor from the field. The cost of the latter is not measured by the manufacturers' price lists, and the cost of current per unit. The question of wiring has to be considered, and with large horse powers, and in the case of motors that require fixing at some distance from the supply mains, or the source of power, this is a considerable item. On the other hand the internal combustion-engine can be placed and run as efficiently and cheaply in one position as another. The questions of noise and smell are merely matters of engineering and chemistry. Already a high-class petrol-driven engine can be made to all intents and purposes noiseless. But the chief point is this. Unless copper and rubber are subjected to an enormous reduction of price, or some efficient substitute for both, of a dirt-cheap nature, is found—neither of which at present appear likely—the electric motor will always be handicapped. It may be said the motor will be improved. No doubt, but it is already vastly superior to the earlier types, and would appear to have almost reached finality. And the internal combustion engine is, to use a conventional term, "in its infancy."

As regards traction, here with electric tramways, we have huge capital expenditure in relaying tracks, laying mains and feeders, fixing poles and overhead equipment, and building cars. The streets, especially where three or more converge, as at the Clock Tower, Leicester, one of the most complicated pieces of this work in the Kingdom, are a network of guard wires, trolley wires, spans, and the like. Ugly cars, with clangorous bells, driving on fixed lines, either impeding, or being impeded by, other traffic, carrying passengers in packages, so to speak, driving through the busiest and ugliest streets in

the town, to enable these passengers to get somewhere near their residences, or business places, do not form ideal means of locomotion. A broken wire, a fault on the station switchboard, and the whole traffic is delayed until the damage is repaired. Of all the monstrosities to which the nineteenth century gave birth, I feel tempted to place first the megatherium-like electric tramcar.

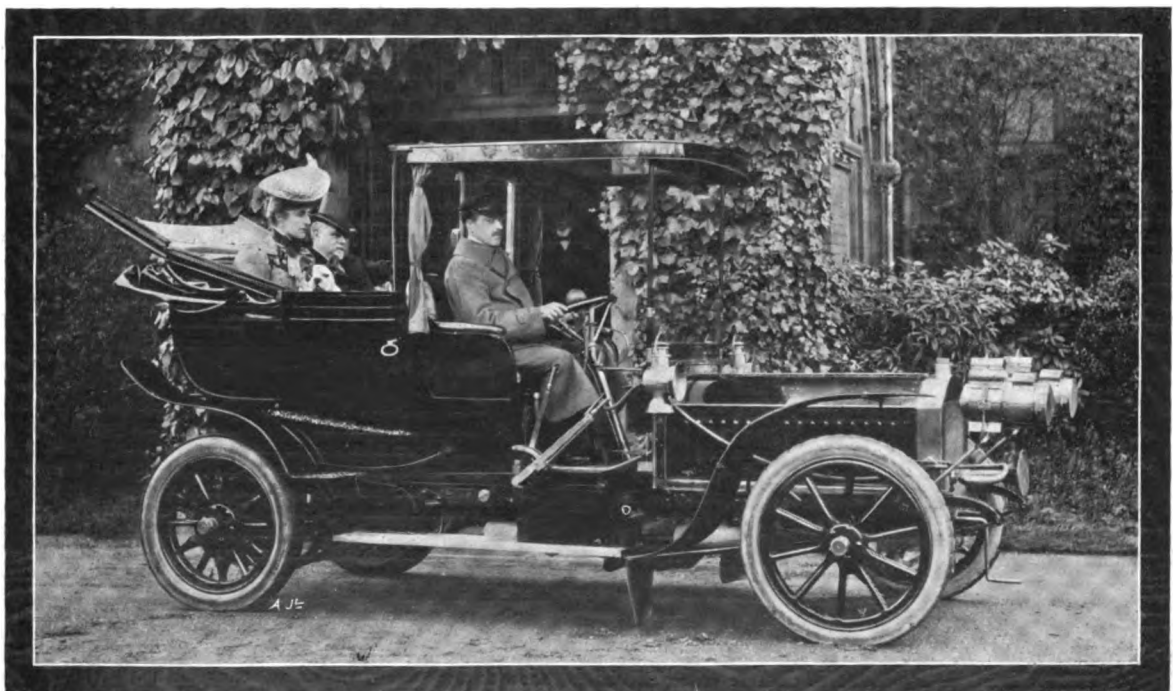
They are welcomed eagerly because we need some means of personal transport more speedy than walking, more convenient than the bicycle. They afford a means of getting about which is cheap, and sheltered in inclement weather. But even as it is, the newer tube railways are vastly superior, as regards speed and comfortable travelling, to any municipal tram service. As a temporary, and extremely costly expedient, the electric tram is welcome. But it has not come to stay, and the question is, how long will it stay?

It will last as long as the capital sunk in tramways can successfully fight capital invested in carriages fitted with internal combustion engines, assisted by public opinion and the natural trend of civilisation. Clever engineers and shrewd financiers are at work on the motor car, which in an incredibly short space of time has developed its sphere of activity from its beginning, as a toy for the wealthy, to the indispensable assistant of all who live off the beaten track of railways. Every day sees it improved, rendered cheaper and more reliable, adapted more and more to the speedy carriage of great weights. And at this very commencement of its career, before electricity has been able to get firm hold of them, we find the most powerful corporations in existence—the railway companies—taking it up, assisting its growth, discerning its marvellous possibilities. So far from

treating it as an enemy, they have welcomed it as an aid. Powerful motor 'buses are already plying for hire, the various omnibus companies are ordering others literally by hundreds, the railway officials are using motor 'buses and luries for their own purposes, and to link up various districts; and already experiments are being made with a view to using the internal combustion engine as a prime mover on existing railway lines. It would appear probable that such an engine could be built at as low, if not a lower, cost than electric motors, and it must not be forgotten that the costly construction and equipment of the electric power generating station, and the expensive alterations necessary for the track, would not be required.

It is certain that before long, the motor car, in its most improved form, will be allowed to demonstrate, on a large scale, its value in dealing with casual traffic. Routes can be opened up by a mere turn of a steering-wheel that are barred to trams, save at the cost of relaying the road, and putting up poles and wires, and putting down bonded rails, granite side-sets, and feeders. And the tram authorities will see that to do this will not pay. People will begin to prefer to sit in carriages equally as comfortable and sheltered as the tram, which shall be more speedy, less likely to be obstructed or delayed, and by means of which more picturesque and even more convenient routes can be taken.

So soon as the improved motor 'bus or carriage becomes a financial success, and the groove tendency gets to work with its series of improvements, so soon will the electric tram, and the electric train, the last hope of the electrical engineer, slowly, but surely, progress towards the final scrap-heap.



Earl de Grey (who is Treasurer in the household of H.M. Queen Alexandra) and Countess de Grey were amongst the first in England to appreciate and make use of the automobile on an extensive scale. They have been cosmopolitan in their selection of cars, and their "stud" at Coombe Court, Kingston Hill, includes many of the best known types of both petrol and electric carriages. Amongst these now is the 30-h.p. six-cylinder Napier Landulette, seen in our photograph, the Earl and Countess being the occupants of this luxuriously-appointed carriage.

CARBURETTORS.*

By Mervyn O'Gorman.

Tampering.—The number of ways in which the quality of the mixture gas has been "tampered with" is great, and an abstract of a few of these, together with some plans which have suggested themselves when searching for them, are given below.

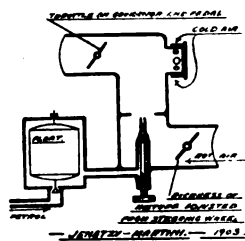


FIG. 5.

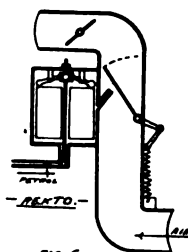


FIG. 6.

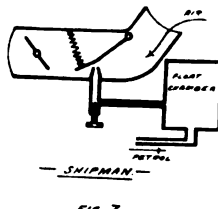


FIG. 7.

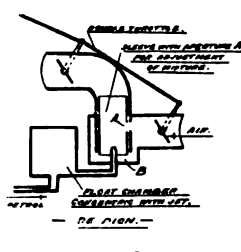


FIG. 8.

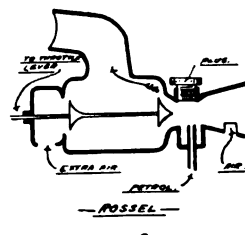


FIG. 9.

It is only hoped that in one or other, or in a simplified combination of several of the following, some ingenious persons here may find comfort, inspiration, and some day let us hope, success.

(i.) Control the richness by hand-throttling the air on its way to the jet. (Martini, 1903.) Fig. 5. (ii.) Control the richness by a spring valve or flap, which throttles the air on its way to the jet (Longuemare old type) as speed increases. (iii.) Ditto unthrottled (Rekto, Shipman). Figs. 6 and 7. (iv.) Control simultaneously by linked throttle-valves, one on each side of the jet, as in the De Dion carburettor. Fig. 8. (v.) Diminish the concentration of the air blast (the injector effect) past the jet by a flybob governor acting on a cam of calculated profile (Gobron). (vi.) Shunt some air away from jet by auxiliary valves, whose opening is controlled by the pressure of circulating water (Napier). (vii.) Shunt some air away from jet by auxiliary valves whose amount of opening depends on the increased vacuum at high speed (Krebs, Crossley,

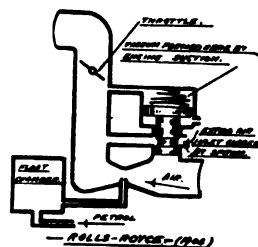


FIG. 10.

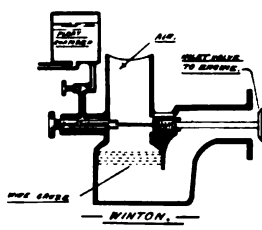


FIG. 11.

Rolls-Royce). Fig. 10. (viii.) Let in the air through a spring-controlled suction-valve, which pushes a needle into, and throttles the jet on opening (Chenard and Walcker). (ix.) Cause the throttle-lever to lower a cone on to the jet so as to increase the suction on the jet when throttle is being closed. (x.) Cause a diaphragm valve to lower a double cone on to the jet (Crouan). (xi.) Throttle by varying the stroke of inlet-valve, and make the stem of inlet-valve control a needle in the jet (Winton). Fig. 11. (xii.) Cause two fluid jets to face each other in such a manner that they collide, and so re-act as to prevent each other's increase in output, when the vacuum increased. A slow stroke at full throttle would, how-

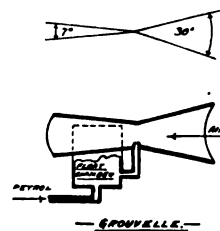


FIG. 12.

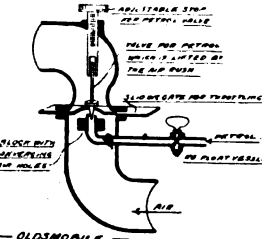


FIG. 13.

ever, not increase this collision, and the fuel flow would increase (Brasier). (xiii.) Control the opening of the jet by a combined aneroid and thermometer. (xiv.) Lower the level of liquid in the float chamber when the petrol consumption becomes rapid, so that less comes out per stroke at high speeds (de Dietrich, 1904). (xv.) Combination such as the Grouvelle-Arquembourg, in which the jet is arranged as in Fig. 12; in the "G.A." apparatus, however, there

is an automatic diaphragm controlling the spray jet. (xvi.) Employ two distinct carburettors, one adjusted for slow running and one for fast, and select the proper one by hand in driving (Bollée). (xvii.) Introduce a resistance to the flow of petrol to the jet which operates chiefly as a loss of "head" when the time for taking the petrol is small (high engine speed) (Sthenos). (xviii.) Mechanically measure out the petrol dose for each speed. (xix.) Increase the

inertia of the petrol by closing the jet with a loaded needle-valve (Oldsmobile). Fig. 13. (xx.) Cause a jet of the "extra" air to be directed out of the jet of petrol, and so choke it back.

An Experimental Carburettor.—An ideal carburettor is one which is extremely simple. Simplicity is the outcome of laborious investigations and intricate experiments. In attempting to put down a scheme for an experimental carburettor, let us suppose that cost does not matter, and therefore begin with a determination to provide against every fault, and allow every adjustment regardless of complexity. This amounts to an attempt to specify what we want. We can simplify and seek for a form compatible with manufacturing conditions later on.

Dirt and Water.—Gauze must be introduced in the course of the petrol to the float-chamber, and a large accessible pocket must be placed under the gauze and under the float to provide a collecting ground for grit, green deposit, and water. The pipe must be long and flexible, and made of soft copper or brass to stand, being fixed to the car at one end and to the vibrating engine at the other. A tap must be provided above the bottom of the float-chamber, so that the sediment in the chamber shall not fall back into the valve-seat.

(To be continued.)



THE DUST PROBLEM.*

By A. Lyle Rathbone, J.P.

THE experiments that have been made in Liverpool during the past three or four years, with a view of abating the nuisance caused by dust, may be divided into two heads—those of purely temporary and those of a more or less permanent character.

Under the first head, I would include the covering of the existing surface of the road with some class of oil. Under the second head might be included the renewing of the surface of the road with some form of macadam or broken stone, securely amalgamated together with cement, tar, or other adhesive material. I propose, therefore, to take the two classes of treatment separately.

The experiments coming under the first head were begun in the year 1902, when the following roads were dealt with:—Prescott Road, Derby Lane, St. Oswald Street, Rathbone Road, and Edge Lane, and the materials experimented with were as follows:—

Creosote oil (hot).	Creosote oil (cold).
" mixed with small proportion of pitch.	" "
" " " "	" resin.
" " " "	" tallow.
Coal tar (hot).	Cheap waste oil from coal tar.
Common petroleum.	Crude Texas petroleum.

The first experiments were made by sprinkling the surface of the road from an ordinary watering-can, and it was found that one gallon would successfully cover an area of eight superficial yards. The cost varied from a $\frac{1}{4}$ d. to a $\frac{3}{4}$ d. per square yard.

It was also found that the oil took a considerable time to soak into the road surface, and accordingly one side of the road at a time was sprinkled, the other side being left, so that rubber-tired vehicles need not pass over the newly-oiled surface. Taken as a whole the experiments were fairly successful, although there were some complaints as to the smell of the creosote oil and also the injury to rubber tyres and coach varnish. The experiments also show that the oiling was a satisfactory method of laying the dust; it tended to preserve the surface of the road; less wear took place; the roads dried more quickly after rain; the disintegration to the surface was not so marked, and the noise of the traffic was somewhat diminished. It is rather difficult to decide which of the

* Excerpt of a Paper read before the Automobile and Cycle Engineers' Institute, on Thursday, the 13th April.

* Excerpt of a Paper read before the Liverpool Self-Propelled Traffic Association on April 13th, 1905.

various classes of the materials would give the most successful result, as the weather during the experiments was, on the whole, very unfavourable, owing to constant rain. The water carts were out for four days only on the adjoining macadam roads. The surface coated with creosote oil mixed with resin gave the cleanest and nicest appearance, while the surface coated with ordinary petroleum was the least lasting, next in order being mixtures of creosote oil with tallow, and the hot creosote oil.

The heavy coal tar waste oil lasted rather longer than the creosote oil, and was very much cheaper. In all cases, the sweeping labour was reduced compared with corresponding areas which were treated only with water; for example, on 5,500 yards, the labour was reduced from a total of seven days to one of four days, while the material removed from the surface was reduced from fourteen to five loads, the total reduction in cleansing and watering being 1'3d. to '55d. per superficial yard over a period of twenty-one days. The first sprinkling kept the surface in good order for about three weeks, the second coat, however, had not entirely disappeared after having been down for nearly five weeks.

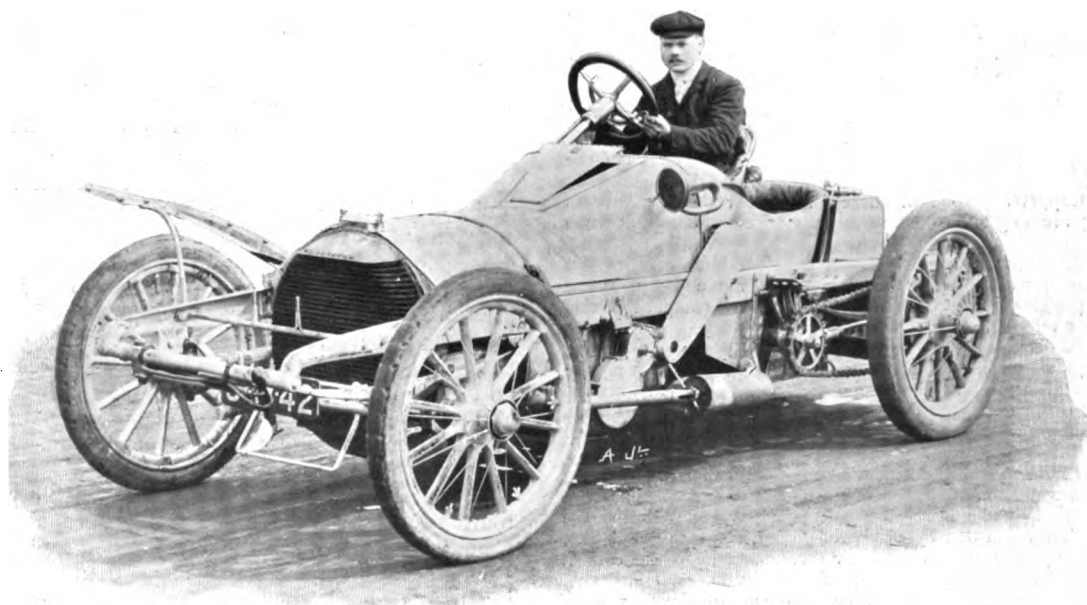
In the following year, 1903, experiments were carried out on two important macadam roads in Liverpool which required a considerable amount of watering. The method of applying the oil was

somewhat different to that used in the previous year. The oil was applied by means of syringes with fine roses, the coating being renewed at intervals of about three weeks; as the result, the surface of the roadway was kept in better condition than if watering had been adopted. The area experimented on was 12,800 superficial yards, and the cost works out at '046d. per single sprinkling, which kept the road free from dust for a period of three weeks. As compared with treating these roads with water, it was found necessary to sprinkle them three times a day, and the cost of this for a period of three weeks amounted to '07d. per yard. This, as compared with the oil, leaves an ample margin for wet days when no watering was required. As in the previous year, it was found that there was a considerable reduction in the cost and quality of the material which had to be moved in cleansing operations, but no special record of these has been kept. Experiments were also made in oiling the wood pavement on one of the principal carriage roads in the city. In this case, however, the results were not so good, as although the dust was kept down very satisfactorily—which could not be done by watering even four times per day—the surface became very slippery in showery weather, and gravelling was necessary.

(To be continued.)



RACES, RECORDS, AND TRIALS.



On March 25th we gave two views of one of the 90-h.p. Wolseley Cars which have been entered for the Gordon-Bennett Race this year. We are now able to give another view of one of these cars. Bianchi is seated at the wheel.

NEW A.C.G.B.I. COMPETITION RULES.

THE new competition rules of the A.C.G.B.I. have now been issued, and should go far to get rid of the number of difficulties which from time to time have arisen under the old rules which were in force. Below we give a summary of the main points likely to be of interest to competitors, omitting such technical details which concern only the actual proceedings of the officials. The usual conditions apply in regard to competitors being acquainted with the rules, responsibility for infraction of the laws of the land, &c. There are also minute provisions for ensuring recognised numbers being carried, passing other competitors, speed in controls, drawing up of programmes by promoters, form and particulars of entries, regulations as to officials and their pay, efficient timing, regulations governing the running of heats, the lodging of protests, offences under the rules, &c., all of which concern mainly those actually engaged in racing or in organising meetings. It must be regarded as an unfortunate omission that an index is not provided. Almost absolute power would seem to be conferred on the "clerks of the course"—in fact, to a degree which many will be disposed to think

should only be permitted to judges—while certain officials, particularly the marshals, have a multiplicity of duties assigned to them which it will tax their physical capabilities very heavily to carry out adequately.

The rules define a "closed" competition as one promoted by a club and strictly confined to its members. An "open" competition is any other competition. "Vehicle" includes all vehicles and boats propelled wholly or partially by mechanical means. In defining the number of passengers, the driver is included as such, and each passenger must be an adult person, not less than 150 lbs., any deficiency being made up by ballast. The rules apply to the United Kingdom and the Isle of Man, but meetings entirely devoted to auto cycles (which are defined as automobiles, weighing not more than 5 cwt., without any restriction as to number of wheels, use of pedals), shall be governed by the Auto-Cycle Club's rules, while those for which motor-boats are alone eligible to compete shall be run under the Marine Motor Association's rules. The rules further provide that, in competitions other than reliability or efficiency trials, no driver shall drive more than one vehicle in any one class; no advertisement or trade sign

may be carried during competitions; no aid may be given by any persons other than the driver and his assistant, except in the case of assisting out of a ford or ditch.

The charge for permits will be one guinea for each day of a meeting, except for affiliated clubs, when half a guinea is the fee. Open meetings must be announced at least 10 days beforehand, and contain certain regular announcements in regard to classification, itinerary, &c. Classification of vehicles must be approved by the club in all open competitions. Where classification is by weight the vehicles must be weighed empty, 15 lbs. being allowed for magneto ignition. The classes are:—

Class I.—Vehicles weighing not more than 110 lbs.

Class II.—110 lbs., but not more than 550 lbs.

Class III.—550 lbs., but not more than 880 lbs.

Class IV.—880 lbs., but not more than 1,430 lbs.

Class V.—1,430 lbs., but not more than 2,200 lbs.

Class VI.—More than 2,200 lbs.

Except in competitions on the track, vehicles in Classes IV., V. and VI. shall carry at least two passengers seated side by side in a fair manner.

Where classification is by price, the entrant, if not a manufacturer or agent, must produce evidence that the declared price is the *bond fide* price paid when new. Manufacturers or agents must give a written guarantee that they will accept at the declared selling price a reasonable number of orders given within one month after the competition. The declared price up to £350 means the price of the vehicle complete ready for the road; over that amount, chassis price only must be given.

All competitors must be on the Competitors' Register of the club, the fee for such registration being 10s. 6d., except for members of the club or affiliated clubs, when it is 5s. Such entries hold good until December 31st each year. An additional annual fee of two guineas must be paid for registering under an assumed name, and in such cases competitors must not compete under any other name. Entries must always close not less than five days before the meeting. All entered vehicles must be the *bond fide* property of the entrant. The name and registered number of the driver must always be given in writing five days before a meeting.

The recognised officials of each meeting are three clerks of the course, a judge, a starter, a clerk of scales, a marshal, timekeepers, and handicappers. None of these officials or the secretary of a meeting are eligible to compete in any competition at such meeting.

The clerks of the course have supreme control for carrying out the meeting according to programme, and shall alone give judgment upon any protests. They may also disqualify any competitor, and prohibit any vehicle from competing.

The judge decides the placing of the vehicles.

Starting must be effected by dropping a flag. Disobeying the starter or starting before the signal may be penalised, and the delinquent re-started at the discretion of the starter not more than 20 yards behind the starting line. A repetition of an offence may bring about disqualification.

The clerk of the scales' duties are responsibility for the weighing of all vehicles and competitors.

The marshals will control competitors and vehicles during the meeting. They will be responsible for proper identification marks, that only the proper driver is on the vehicle, shall keep the course, and generally watch the proceedings of the meeting.

All open competitions must be timed by official timekeepers of the club, the timekeepers not being allowed to communicate any times or results other than to the judge.

Handicaps must be framed by an official handicapper of the club.

Applications for licences for tracks must be accompanied by a plan and elevation of the track, showing the gradients and other dimensions. Restrictions may then be placed as to how many may compete on such track.

Attempts to make records other than at a meeting must be given 10 days' notice beforehand, and any records claimed must be substantiated within 7 days after its alleged accomplishment. A register of records will be kept, those officially recognised being 1 kilom., 1 mile, or any multiple thereof, either with flying start or from rest. Time records will be kept of 1 hour and multiples thereof.

Protests must be accompanied by a deposit of £5, which will be forfeited in the event of the stewards not considering there was good and reasonable ground for protest. All costs and expenses in relation to determining a protest, and any reasonable compensation for outlay incurred, must be paid by the protesters in such proportions as the clerks of the course decide.

Misbehaviour or unfair practice in connection with automobilism will be regarded as a breach of the rules, and shall render liable to suspension, as also any person who corruptly gives or offers any

bribe to any official, or any official who accepts any bribe in any form. Appeal against suspension must be accompanied by a deposit of £10. Any sentence pronounced by the stewards is final and without appeal, and on appeal to the stewards they have the power to increase any penalty before made, and may change disqualification to suspension. A maximum of twelve stewards is appointed by the club, who are elected annually in April by the general council of the club.



Filey Sands Speed Trials.—The speed trials arranged for by the Yorkshire A.C. on the sands at Filey, will be held on Whit-Monday next. The course, which will begin on the Muston Sands and finish on Filey Sands, will be over a mile, with half a mile for getting up speed and the same distance for stopping in. An elaborate programme embracing at least eight events has been arranged, calculated to attract a considerable number of holiday visitors. A number of trophies will be offered for competition, including one presented by the proprietors of the *Sheffield Daily Telegraph*. This latter cup will be open to members of the Yorkshire Club for touring cars up to 24-h.p., divided into two classes, viz., (1) up to 12-h.p. and (2) from 12 to 24-h.p., the winner of each class to meet in a final upon handicap terms. In addition to a number of classes for fully equipped touring cars, the club will also hold two open classes for racing cars. As the sands at low water are stated to possess a hard surface suitable for the purpose, and a magnificent view can be obtained of the races from the sea-wall, a very large gathering should result.

WHEN the Brighton Motor Meeting was originally announced by us, we stated that the programme would probably be made of a specially interesting character, and likely to attract entries from private owners. The idea which is being favoured is to create a number of events in which cars of a similar horse-power and make are run against each other, and in order still further to increase the interest in these races, it is contemplated that while each section or sub-class shall receive a first and second prize, the whole class of each make shall, in a final, which will consist of the winners of the sub-classes, run in a handicap for a special cup.

THE founding of an international reliability trial for touring cars by the A.C.G.B.I. is proposed by Mr. Claude Johnson on similar lines to the present Gordon-Bennett Cup for racers. It is suggested that the following points should be considered in the event of the suggestion being taken up: The weight of the car to be limited, a certain speed with a full complement of passengers, etc., on a specified hill to be compulsory for eligibility to compete. Cars to be 4-seated, and carry their full number of passengers throughout. There should be no limit of horse-power, but a speed limit should be enforced, whilst the usual provisions in regard to repairs and supervision should form part of the scheme.

Gordon-Bennett Race.—Opinions amongst the crack French drivers appear to differ slightly only in regard to the speed which will be maintained throughout the race in order to give a chance of getting successfully round the Auvergne Circuit. Girardot considers each tour will occupy about 1 hour 40 or 45 mins., giving a speed of about 80 kiloms. per hour. Any driver who endeavours to get through on higher speeds from the commencement, stands practically no chance whatever of being

in at the finish. In any case, he considers that nobody but an athlete can possibly "stay" the entire distance, owing to the extraordinary nature of the course.

Albert Clement thinks 75 to 80 kiloms. will be the average speed of the successful competitors, whilst Duray puts the figure at 76.

OWING to the dates of the Aix-les-Bains Automobile fortnight clashing with the dates of the special sporting events which it has been announced the A.C. of Auvergne intend organising between the French Eliminating Trials and the Gordon Bennett race itself, the Auvergne Club propose reconsidering the whole of their programme and making fresh arrangements in order not to interfere with the Aix-les-Bains events, or, in the original words of the official announcement, the fêtes Commission "*vont donc étudier d'autres projets.*"

Vanderbilt Cup.—For the French Selection Trials for this cup 9 cars have now been entered, viz., 3 Panhards, a C.G.V., 2 De Dietrich, and 3 Bayard-Clements.

UNDER the auspices of the Dutch Automobile Club a 3-days' reliability trial is to be run off during the end of May. The start will be made from Amsterdam, and The Hague will be the finishing point, making a total distance of 835 kiloms.

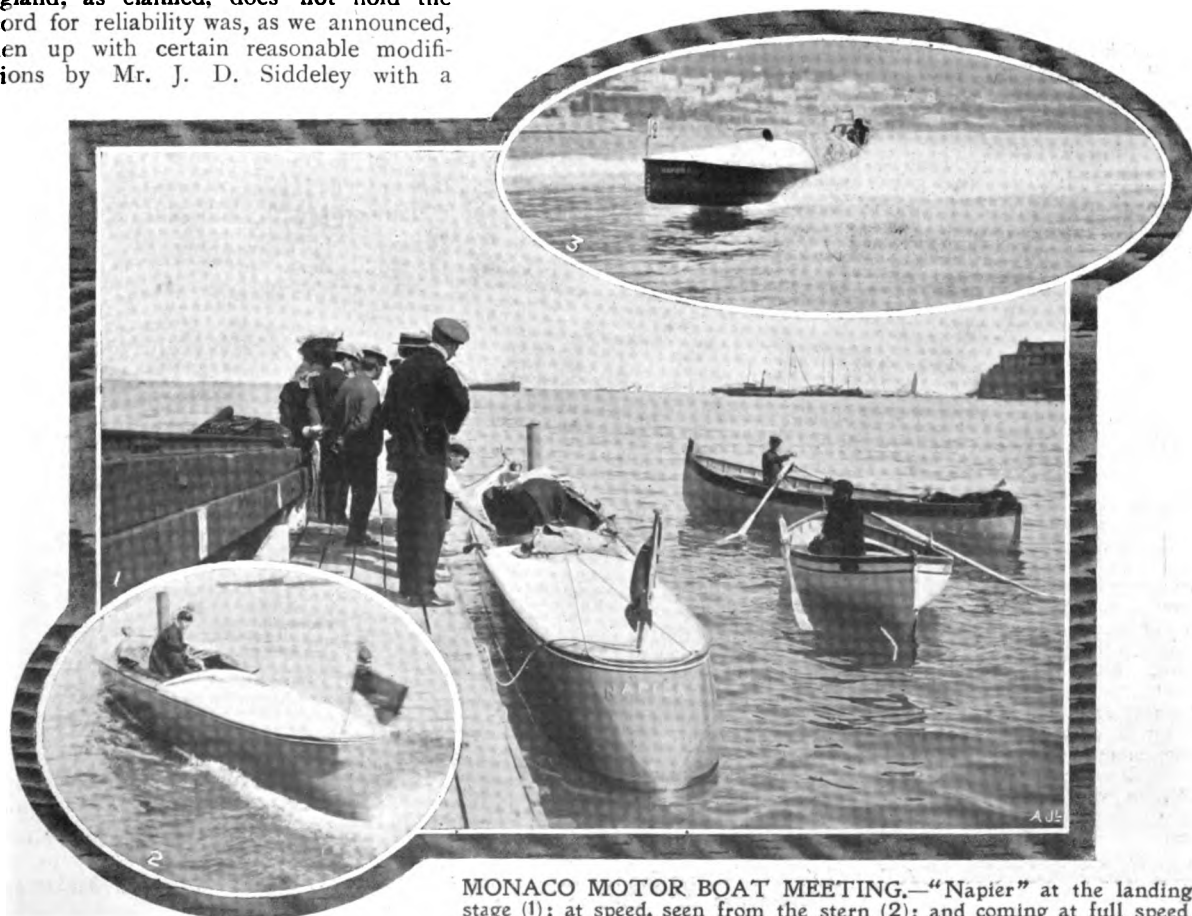
M. PAUL MEYAN's challenge to any British car owner to compete against him in France on his De Dietrich carriage, over a distance of 5,000 kiloms., in daily runs of 300 to 400 kiloms., in order to demonstrate that England, as claimed, does not hold the record for reliability was, as we announced, taken up with certain reasonable modifications by Mr. J. D. Siddeley with a

Siddeley car. M. Meyan, however, now announces that his challenge was not open to be accepted with the reservations made by Mr. Siddeley, and, therefore, he is not prepared to entertain the acceptance under the circumstances.

THE Reliability Trial, being organised by the Austrian Automobile Club from Vienna to Breslau, and back again to Vienna, will commence on the 17th of next month, and end on the 21st. The general lines on which the trial will be conducted resemble those which have prevailed in the case of similar events held in this country, the points for which marks will be given being the following:—

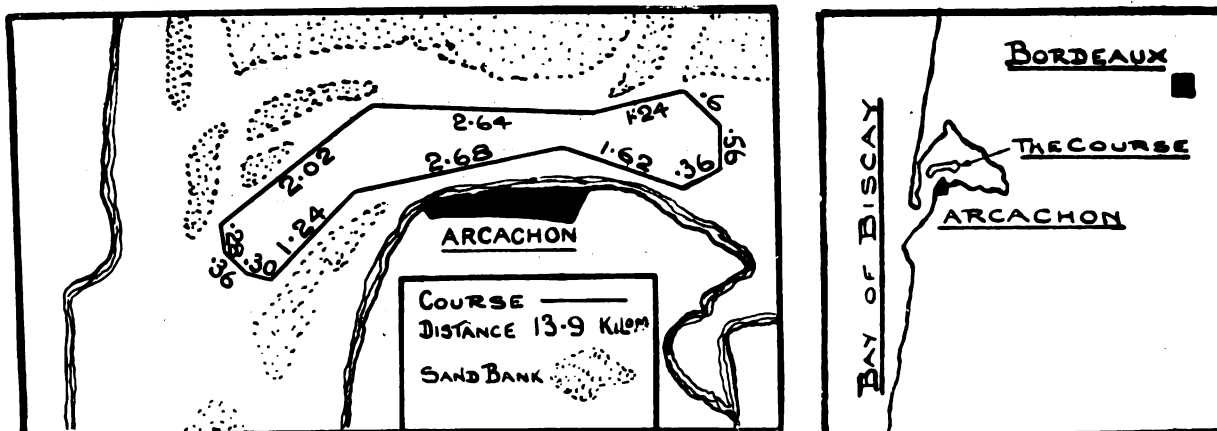
1. Reliability of running (500 marks).
2. Average speed (300 marks).
3. Speed up hill (150 marks).
4. Highest speed (100 marks). (This, as in the case of the English trials, will be taken on a special point, and does not refer to the whole run).
5. Fuel consumption (300 marks).
6. Consumption of cooling water (100 marks).
7. General comfort and convenience (100 marks).
8. Tyre reliability (100 marks).
9. Price of chassis (200 marks being allowed for the lowest-priced chassis, marks being deducted as the price rises).

International Cup.—Following a request from the Races Committee of the A.C.G.B.I., the Auto Cycle Club have arranged to hold their selection trials for this Cup in the Isle of Man on the day after the eliminating trials for the Gordon-Bennett Cup Race, viz., May 31st.



MONACO MOTOR BOAT MEETING.—"Napier" at the landing stage (1); at speed, seen from the stern (2); and coming at full speed in the 100 kilometre race (3).

MOTOR BOATING.



COURSE FOR THE BRITISH INTERNATIONAL CUP RACE FOR MOTOR BOATS.—The above is the course over which the possession of the Trophy presented by Sir Alfred Harmsworth will be disputed in September next. In the key map we show the position of Arcachon in relation to Bordeaux.

Burton Cup.—As usual, following the Monaco meeting, the Cannes Regatta and a series of motor boat events again took place, commencing last week. The number of actual competitors in the various events was not large, but some interesting races resulted. The great attraction of the entire meeting was naturally the contest for the Burton Cup, which was down for competition the first two days of this week. The race is open to motor boats, without any restrictions beyond length limit of 18 metres (59 feet). The distance is over 100 kilometres. A fair number of entries was received, but only five starters crossed the line, viz., "Elise," "Janus," "Rafale," "C.G.V.," and "Delahaye I." The three first named abandoned the race, the winner being "C.G.V." in the time of 2 hrs. 45 mins. 16 secs., Delahaye taking 3 hrs. 5 mins. 36 secs. We reproduced a photograph in our issue of April 8th of the very beautiful cup presented by Mr. Alexander Burton.

IN 1906 an endeavour is to be made to institute a motor boat world championship race at Palermo, with a first prize of 50,000 francs.

AN important motor boat race is to be organised from Boulogne to Cape Grisnez, to take place on July 1st. It is being supported by the Boulogne Municipal Council, the Commercial Union of France, and other important bodies who have apportioned to it considerable money grants.

Cross Channel Race.—Again there is a wavering in regard to the finishing point for this important race. Already we have recorded numerous changes, the latest being last week, when Dover was selected by the A.C. de France, the same as last year. Now it appears that the finishing point will in all probability be Folkestone, whilst instead of starting from Calais, the boats will be sent off from Boulogne.



MONACO MOTOR BOAT MEETING.—Start for the 200 kilom. Championship of the World. "Madricto," "Delahaye II," "Pi-Ouit IV," and "Elise."

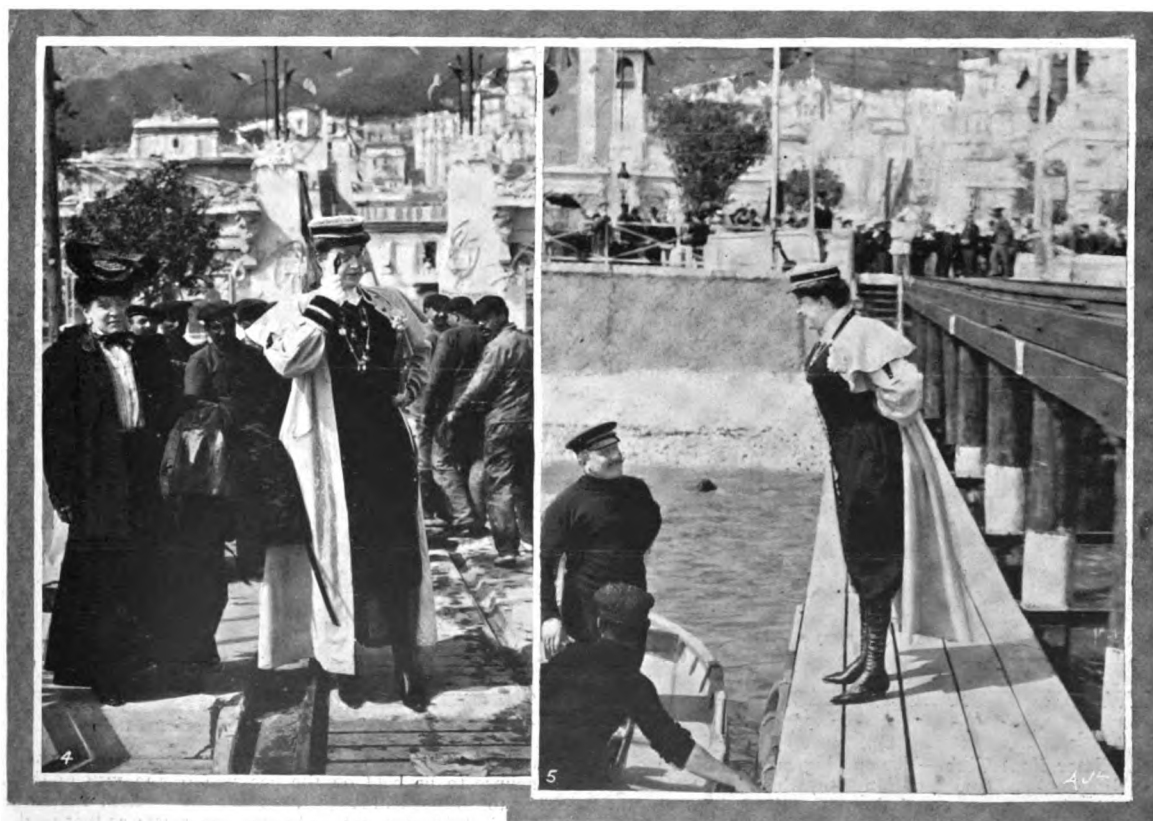


MONACO MOTOR BOAT MEETING.—Madame Du Gast on board her racer, "La Turquoise," preparing for the fray.

Paul Meyan Cup.—Following the Monaco Motor Boat Races in like manner to last year, the contest for the Paul Meyan Cup took place last week between Nice and Antibes, a distance of about 100 kiloms. Starters were extremely scarce, only two crossing the line, viz., "Elise," fitted with a Delahaye motor, and "Delahaye I.," also engined with a Delahaye. The former boat was the winner in 3 hrs. 3 mins. 50 secs., "Delahaye I." being timed for 3 hrs. 21 mins. 44 secs. "Elise" therefore takes the cup held previously by "Vas-Y," a boat

also driven by a Delahaye engine. Subsequently, in a speed test over $4\frac{1}{2}$ kiloms., "Delahaye I." beat "Elise," covering the distance in 9 mins. 40 secs., against "Elise's" 10 mins. 5 secs.

Paris to the Sea.—Instead of the beginning of August, it has now been decided to run this motor boat event off from July 20th to 26th, which will enable competitors to take part in the big national yachting meeting which has been arranged to be held at Havre.



Madame Du Gast is interested—

And amused.

MONACO MOTOR BOAT MEETING.

At a moment when the sea-going capacities of the motor-boat are, owing to the proceedings at Monte Carlo, somewhat under a cloud, it is particularly appropriate that Mr. Edge, with his usual enterprise, has determined to demonstrate what a properly-built boat with motor equipment can accomplish. "Napier Major," which was illustrated and described in our issue of the 8th inst., is a comfortable 12-ton cruising yacht, and is fitted with a 20-h.p. Napier marine motor. She left the Temple Pier on Thursday at two p.m., with the intention of making a long distance non-stop run of about 750 miles up the east coast to Lerwick in the Shetland Islands, calling at a number of the chief ports and watering places on the way back. "Napier Major" can carry enough petrol to run about 2,000 nautical miles, and is undertaking the voyage with a crew of four persons, consisting of Mr. A. F. Evans as captain, Mr. W. Herman as his chief mate, assisted by two "hands." As soon as the boat got out of the shelter of the land the wind was found to be so strong as to make it inadvisable to do more than just keep going. On Sunday, however, the wind veered slightly, and Evans was able to push ahead so that "Napier Major" was sighted off Aldeburgh by Lloyds at 12.30 p.m. on Sunday, and the latest news from

Mr. Edge is that she passed Lowestoft at 3 a.m. Monday morning.

ON May 7th, the motor boat race across the Mediterranean, from Algiers to Toulon, takes place in two stages. The boats, which will be convoyed across by a number of torpedo boats, will start from Algiers, and run to Port Mahon, in Minorca, the first day, and thence to Toulon on the second day, so as to avoid the dangers of carrying on the race during the night; 15 boats are already entered, of which 3 competitors are English, viz., the two Napier boats and "Mab." Considering how fully the Monaco boat races demonstrated the imperfect sea-going capabilities of high-speed motor boats, as at present constructed, it is devoutly to be wished that this long sea race (500 miles from start to finish), will not be productive of any serious accident. The Mediterranean is notoriously squally and uncertain, and serious storms get up with astonishing rapidity. At Monaco the boats that suffered could be towed quickly into port and their occupants rescued, but matters will be very different in the case of a competition where, at times, the boats concerned will be 100 or more miles from land.



M. Tellier.

Mdme. du Gast.

M. Georges Prade.

MONACO MOTOR BOAT MEETING.—Some prominent personages at this meeting, as seen by "Sem," of "Les Sports."

British Motor Boat Club.—The opening meeting of the club will be at Kingston-on-Thames, on May 6th, when a fleet of motor launches will take a run up and down the river about 4 p.m., returning to the Sun Hotel, Kingston-on-Thames, in time for dinner. Admiral Sir William Kennedy, K.C.B., commodore of the club, will, we understand, be "in command." The club is, we learn, arranging races for motor boats in all the important regattas round the coast, and, where possible, on the rivers. In

addition to the international races for motor boats, which they announce to be held on the occasion of the visit of the French Fleet to Spithead in August, races are to be held in Southampton Water in July over practically the same course as that used for the reliability trials. Races will be held in Belfast Lough in conjunction with the Silverstream Regatta Committee.

Headquarters have been fixed up at the Craven Hotel, Craven Street, Strand, where the club will move on May 1st.

CLUBS AND ASSOCIATIONS.

Blackheath A.C.—Members of the club are joining in an opening run for the season to-day, Saturday, when the destination is the Bull Hotel, Chislehurst. Members will meet at the Honorary Secretary's house, Westcombe Park.

Blackpool and Fylde A.C.—Last week it was resolved amongst a number of local motorists to form a club for the district under the above title. Mr. Wilfrid Ashley is the first president proposed, and Mr. James Blundell has been elected captain, with Mr. Norman Taylor as vice-captain. Mr. W. Fisher will act as secretary *pro tem.*, and the committee consists of Messrs. Nearing, N. Taylor, H. Dews, L. Dews, S. Blundell, J. Blundell, Hodge, W. Fisher, and Singleton. The headquarters of the club are to be at the Metropole Hotel.

Motor Union of Great Britain.—Since the March meeting of the General Committee of the Motor Union, 11 new clubs have joined, 8 of which are motor cycling clubs, who have joined under the provisions of the special autocycle scheme. In addition over 80 members have joined individually, bringing the membership of the Union to upwards of 9,000.

Motor Union of Western India.—At the annual general meeting of this Union, held on April 5th, presided over by Lieut.-Col. M. A. T. Collie, the chairman devoted a considerable portion of his remarks to the Delhi-Bombay Trials. He justified in every respect the proceedings of the Union in the appointment of the judges and in the results announced. He stated that the committee, in spite of all the adverse remarks, declined to embark on a newspaper correspondence with the competitors, especially as many of the statements, he asserted, were either groundless misapprehensions or misunderstandings. In regard to the slight alterations which were made in the rules, these, he stated, were made at the request and in accordance with the wishes of the competitors themselves, and that such alterations as were made did not in any way affect the results. In regard to the statement that the judges' report had been suppressed by the committee, he stated that no report whatever had ever been submitted by the judges beyond the actual awards which they made without assigning any reasons whatever, and this was published.

Amongst the most recent members who have joined the Union is H.H. the Maharaja Scindia of Gwalior.

Motor Van and Wagon Users' Association.—Twenty new members have joined the Association since the occasion of the commemorative luncheon on March 21st. Amongst these are Messrs. William Moore, 16, Sutherland Street, Runcorn; James Putman, Bicester Road, Aylesbury; Stuart's Granolithic Stone Company, Limited, Glengall Road, Millwall; the Leigh Friendly Co-operative Society, Limited, Leigh; and Thomas Riley, North Lincs. Steam Saw Mills, Fleetwood.

North-East Lancashire A.C.—Last week the club had a very successful gathering for their first meet of the season. On previous occasions when the club has had a run, the members have met at a specified starting point and have journeyed to their destination in more or less of a procession, but owing to the almost intolerable dust nuisance which this mode of progression has frequently created, the club has decided to ask the members to meet at their destination, and this was done on Saturday. The members, therefore,



French International Sports Exhibition.—So much difficulty appears to be arising in connection with the selection of a suitable site in 1907 for this Exhibition in Paris that in all probability it will be postponed for one year, and take place in 1908.

It is satisfactory to learn that the great growth of the British automobile industry is becoming generally described in the French Press as "Le Peril Anglais." The proposal to hold the next Olympia Show in November is looked upon as a very astute move by the British manufacturers with the view of being in the field before their French rivals have their next year's models ready.

foregathered at 4.30 p.m. at the Queen's Hotel, Southport. The following members and their cars took part in the run:—Dr. Fox, Accrington (Belsize Jr.); P. J. Broadley, Accrington (12-h.p. Wolseley); R. Greenwood, Blackburn (15-h.p. Darracq); Dr. Patterson, Blackpool (6-h.p. Humberette); H. Lonsdale, Accrington (15-h.p. Darracq); F. Birtwistle, Blackburn (18-28-h.p. Mercedes); D. Coddington, Southport (12-h.p. Lanchester); E. Crossley, Accrington (30-40-h.p. Belsize); Arthur Birtwistle, Blackburn (22-h.p. Daimler); R. Spencer, Blackburn (14-16-h.p. Rex); H. Appleby, Cherry Tree (6-h.p. Siddeley).

Yorkshire A.C.—In connection with the speed trials on Filey Sands arranged by this club to take place on Whit-Monday and of which particulars are given by us under "Races, Records and Trials," a deputation from the club, consisting of Mr. W. Penrose Green (vice-president), Mr. E. H. Hepper (chairman of committee), Mr. C. P. Wilson (hon. sec.), and Mr. A. W. Roslington visited Filey on April 1st, in order to interview the representative of the Filey Urban District Council and the Muston Parish Council and arrange the preliminary details.

The deputation met with the greatest courtesy and good-will on every hand, and the co-operation of the governing bodies was given with the assurance to do all that lies in their power to make the visit of the Yorkshire Automobile Club and friends a pleasant one and the meeting itself a most successful one. On Whit-Saturday, a "non-stop" run from Leeds to Filey will be held as a preliminary to the Monday's sport. At Filey the headquarters of the club will be at the Royal Hotel, the proprietors of which hostelry have arranged to be moderate in their terms to visitors. Cars can be garaged at the hotel and an efficient supply of petrol will be on hand.

Mr. H. R. Kirk, of Leeds, one of the vice-presidents of the club, has recently tested a high-speed car over the proposed track, and reports very favourably upon the speed attainable. Every effort was made to see if any impression was made upon the surface of the sands by continual running over them. Although the conditions were extremely unfavourable, including drizzling rain and a strong easterly wind blowing, all the tests resulted satisfactorily, and speeds, it is stated, were timed up to 80 miles per hour.

DR. EDWARD CRAGG, the hon. secretary of the Lincolnshire A.C. has been testimonialised by his fellow-members by means of an illuminated address and something more substantial in the form of a motor car. His fellow-members have taken this method of recognising the enormous amount of work which Dr. Cragg has done for automobilism generally and the Lincolnshire club's affairs in particular.

At the general meeting of the Roads Improvement Association, held last week, Mr. Robert Todd occupied the chair. Mr. Todd mentioned the fact that the Highway Bill which they had in hand was now drafted and well on the way to introduction in the House of Commons, and a copy would shortly be sent to the members and those interested. In detailing the enormous scope of the work of the society, he drew attention to the fact that the questions with which they dealt covered side-slip, Roman roads, steam-rolling, the lighting of vehicles, the dust question, by-laws in local areas, road-marking, and many other matters. At the conclusion of the meeting it was announced that the Right Hon. Earl Cadogan, K.G., had, upon the invitation of the Council, accepted the office of president of the association.



It is urged, therefore, that French makers should spare no pains to have their new models ready for the Olympia Show—which in other words means that the Olympia Exhibition will be the event of the year. Among the advantages presented to the British buyer by British manufacturers is, the French critics state, the fact that he can frequently obtain a car almost immediately on paying for it, whereas for the leading French vehicles he may have to wait months, while the advantage of being able more readily and cheaply to procure spare parts in the country in which the car is built is one which the French manufacturers are recognising as calculated to seriously interfere with their export trade to Great Britain.



THE BRIGHTON ROAD "PATROL."—The "officer" (in the car), in charge of the cyclist staff of Messrs. Charles Jarrott and Letts, and two of his staff, who have been endeavouring to help the Sussex police in preventing automobilists from infringing the speed limit.

FROM correspondence which we have received, it is plain that the efforts of Messrs. Charles Jarrott and Letts to assist the police in restraining the excessive speed of motor cars on the Brighton road is both proving highly successful and is being generally appreciated by automobilists who traverse that highway, many of them having returned thanks for the effective manner in which they have, by the friendly warning provided, been prevented from breaking the law and suffering from the consequences. Doubtless the efforts of Messrs. Jarrott and Letts are appreciated by the Sussex Constabulary, but we have not yet heard that any letters of thanks for friendly co-operation and assistance have been received from that body.

MR. CHARLES JARROTT, who availed himself of the opportunity of the Monaco Meeting to obtain a little relaxation, has just driven from Monte Carlo to Paris on his De Dietrich in 23½ hours' running time. Most of the time it was raining hard, and the roads were very bad, but with his usual cheery content he describes the journey as splendid, from the fact that he had no troubles from start to finish. The statement published in certain quarters of a win of £3,000 by Mr. Jarrott during his stay on the Riviera, is, we understand, a pure *canard*.

LORD BALCARRES stated recently in Parliament, in reply to Mr. Scott Montagu, that he hoped the appeal to the Divisional Court to test the legality of the police park rules restricting motor car speed to 10 miles per hour would come on for hearing early next session.

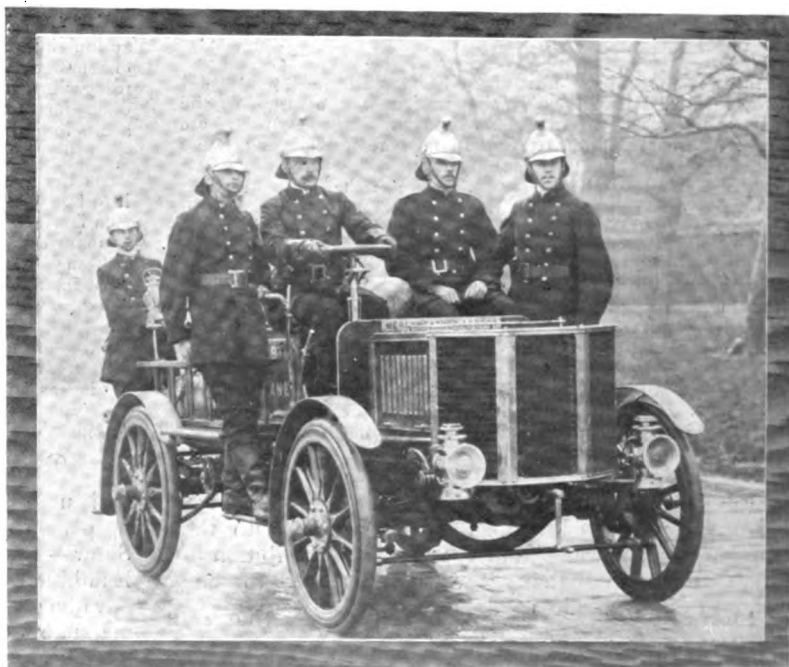
MOTOR trains for the first time appear as a feature in the May time tables of the Great Western Railway.

THE letters "L. C.," it is now officially notified, is the second index mark for motor cars, which has been assigned to the London County Council.

THE Prince Regent of Denmark, accompanied by his two sons, inaugurated last week the Stockholm Automobile and Motor Boat Exhibition.

THE Coronet Car last week completed successfully a 1,000 miles test tour in six daily journeys out and home from London, visiting Folkestone, Hastings, Brighton, Bournemouth and Bath. A feature claimed for the car, which has been designed by Mr. W. Iden, is plain bearings throughout, and simplicity in the working parts.

THE Crossley-Leyland omnibus, which was on show at the Agricultural Hall, has since been running ninety miles a day continuously from Surbiton to Kew, under the auspices of the New London and Suburban Omnibus Company. The vehicle has proved so capable of performing all required of it that six more omnibuses of exactly the same type have, we learn, been ordered.



A MOTOR CHEMICAL FIRE ENGINE FOR BRISBANE.—Australia has already proved appreciative of the advantages of a self-propelled fire engine, and our photograph shows the latest machine which has just been despatched to the M.F.B. of Brisbane, by Messrs. Merryweather and Sons. The chassis is fitted with a four-cylinder 20-h.p. engine, has a change-speed-gear of the sliding spur-wheel type, and the rear wheels are driven by side chains.

NEARLY every subject, however serious and important, sooner or later has its comic interlude. In regard to the dust question, to which we devote a good deal of space in the present number, this element of comedy is provided by the writer of a letter to the *Daily Mail*, who declares that the dust nuisance does not exist to any extent in Northumberland, as the roads there are mended with what he terms "balsamic rock." "Balsamic rock" should undoubtedly have the effect, in addition, of making the roads fragrant as well as dustless. The writer suggests that county surveyors would find it cheap in the long run to send a couple of hundred miles for this stone. But perhaps, after all, it is only basaltic rock that is meant, and that can be obtained a good deal further south than Northumberland.

KING'S ROAD, Brighton, is not to be invaded by self-propelled public vehicles. By twenty-six to sixteen votes the Brighton Council last week refused permission for a service of motor omnibuses to run along the King's Road in connection with a service between Worthing and Brighton.

THE Burmese dwarf, Smaun Sing Hpoo, who has just come to this country, ought to have a future before him as a mechanician, for from photographs published it would appear that he is small enough to get inside an ordinary motor car bonnet. He thus ought to prove of use during races and competitions.



CORRESPONDENCE.

*. The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

CYLINDER LUBRICATION OF MODERN CARS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I am pleased that your correspondent thinks that the Napier lubrication which I referred to is good, and the only points he raised were in accord with me.

First.—The cocks are arranged in such a way that they are higher than the front axle from the ground, so that unless one carried the front axle right away, the cocks are not likely to be damaged.

Secondly.—We do use separate oil feeds to each crank-chamber, but we do not lubricate our cylinder walls at all, we depend entirely on sufficient splashing from the crank-chamber for this purpose, and we find it satisfactory.

I have just returned from a trip of over two thousand miles on a Napier car fitted up with lubricators in this way, and I found that under no circumstances was it necessary to let the engine smoke.

Yours truly,

April 20th.

S. F. EDGE.

The Show Question.—Mr. W. M. Letts writes to us further upon this subject, pointing out in reference to the holding of the Olympia Exhibition in November, that a number of his correspondents have enquired what Messrs. Charles Jarrott and Letts are going to do. His firm, Mr. Letts informs us, have decided not to sign the bond, and not to apply for space at the Exhibition, for the reasons which he brought forward in a letter of considerable length which we published in a former number. The firm further state that they intend, on the contrary, to exhibit at Messrs. Cordingley's Show at the Agricultural Hall in March, and very probably at the Crystal Palace in January also.



Another view of the Brisbane motor chemical fire engine, showing the two chemical cylinders at the rear, and the two hand extinguishers which are carried on the step. The two large cylinders have a combined capacity of 72 gallons, and each will maintain a jet for 10 to 15 minutes, thus affording plenty of time for recharging the empty cylinder if necessary.

COMMERCIAL POINTS.

WE have received a copy of the 1905 edition of Smith, Parfrey and Co's. catalogue, which, as usual, contains a most comprehensive list of motor car forgings, wheels and tyres. This old-established firm have taken up the supply of automobile parts in a very thorough manner, and they have an excellent selection of forged axles, brackets, springs, shafts, etc., as well as many examples of bent timber and their well-known artillery wheels. Smith, Parfrey and Co. also keep a stock of motor car lamps, both acetylene and oil, and undertake the recharging of accumulators and the cutting of gear-wheels.

MAJOR KENNARD, brother of Mr. Edward Kennard, the well-known motorist, has just purchased a 20-26-h.p. Clément car from Mr. E. H. Lancaster. Mr. Lancaster has also been favoured with an order for a Clément from George Whiteley, Esq., M.P.

ALL automobilists like to know the mechanism of their cars, and many firms have published very comprehensive booklets giving practical information on the points of interest and importance in their vehicles. Such a book is that issued by the Duryea Company, describing their well-known power carriages. The details of the cars are well illustrated, and the special features of this very distinctive system, and the advantages claimed for them by the makers, are fully explained in the text.

THE Dunlop Tyre Company have just been favoured with a contract for the supply of motor tyres to the War Office.

MR. IVON. M. DE HAVILLAND, A.I.E.E., who has for some time been with the Daimler Motor Company, has now, we learn, joined Messrs. Legros and Knowles, of Willesden, in the capacity of designer and engineer.

HOTCHKISS cars appear to be receiving a considerable amount of favour in England in the hands of the London and Parisian Motor Company, Limited, the British concessionaires. Amongst those who have recently secured models of this type are the Marquis of Salisbury, Sir Philip Grey Egerton, Bart., the Hon. Francis Egerton, Major Laycock, D.S.O., and Mr. Lewis Waller.

THE Continental Tyre and Rubber Company (Great Britain), Limited, send us their latest price list of Continental tyres and accessories. The tyres range in size, as before, from 2½ ins. to 6 ins. In the former size there are three different grades, to carry respectively 240 lbs., 400 lbs., and 600 lbs. per wheel. A similar variety obtains in the 3-in. size, and all tyres are, of course, made in a very large range of diameters.

S.A.R. THE DUKE OF GENEVA, brother of Queen Margherita of Italy, and Commander-in-Chief of the Italian Navy, has, we learn, just purchased a 24-40-h.p. Fiat car. The Duke is a strong supporter of automobilism, and is President of the Automobile Club of Italy.

MESSRS. H. AND J. READING, of 14 and 15, Ridinghouse Street, Langham Place, have been appointed sole London agents for the Turner-Miesse steam cars. They are in a position to give trial runs to those interested in this system.

SEVERAL useful accessories are included in the catalogue issued by the "Automatic" Company, who are agents in this country for a number of French specialities in the way of carburettors, contact makers, etc. One of these devices is a commutator which automatically times the ignition according to the speed of the engine. The apparatus is similar to that described by us in our issue of May 23rd, 1903, in connection with the Crouan cars, to which such a device was fitted.

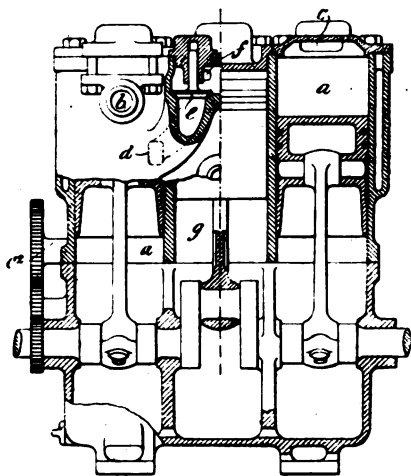
THE 1905 edition of the Automoblist's Guide Book for Germany, issued by the Continental Caoutchouc and Gutta Percha Company, Hanover, can now be obtained from the Continental Tyre and Rubber Company (Great Britain) Limited, 104/108, Clerkenwell Road, E.C., at the price of 2s. The 1905 edition of the Automoblist's Guide for Great Britain and Ireland, issued by the Continental Tyre and Rubber Company, will be published at the end of this month.



BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

9888. 20th April, 1904. Improvements in or relating to Explosion Engines. E. T. Pollard, 49, Cannon Street, London. This specification describes a very ingenious and meritorious attempt to overcome the difficulties in constructing a compound internal combustion engine. There are three figures. Of these, Fig. 2, a part sectional elevation of the three cylinders, best shows the arrangement. *aa* are the two explosion cylinders, in which working strokes take place alternately, the one following the other. *b* are the admission-ports, and *c* the exhaust-ports, the exhaust-valves of which are operated every alternate stroke by cams on the half-speed shaft, *c'*. The

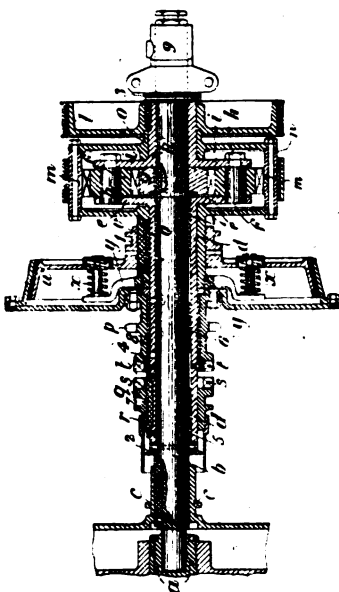


pistons in the cylinders, *aa*, uncover near the end of their strokes-ports, *b*, by which the products of combustion pass by non-return valves, *e*, to passages, *f*, leading to the top of the cylinder, *g*, the piston in which is connected to a crank at a suitable angle (the specification states about 120° behind) to those of the other pistons, and is acted upon every stroke by the products of combustion from one or the other of the high-pressure cylinders. The exhaust-valve of the cylinder, *g*, is not shown, but it is opened every revolution by a cam, instead of once every two revolutions. It will be seen that at the end of each working stroke in the high-pressure cylinders the gases lift the valves, *e*, and pass into the top of the cylinder, *g*, so that a working stroke takes place in the low-pressure cylinder every revolution.

As time would be taken in the passage of the gases from the high-pressure cylinder to the low-pressure cylinder, the chief difficulty to be overcome

in an engine of this construction is that, if the engine were working slowly, the gases from the high-pressure cylinder would reach the low-pressure cylinder earlier relatively than they would when the engine was working at a high speed, with the result that the pressure of the gases would be exerted upon the low-pressure piston before it reached the top dead point of the stroke. In this case, therefore, until the dead point were past, resistance to motion of the engine would be produced in compressing these gases. If the engine were working at a high speed, the low-pressure piston would probably reach the top of the stroke before the gases from the high-pressure cylinder exerted their pressure upon it. The ideal condition, of course, would be that the gases from the high-pressure cylinder should reach the low-pressure cylinder when the piston is at the dead point of the stroke, whatever the speed, might be within the desired limits. There is also the difficulty of preventing excessive cooling of the gases in their passage from the high-pressure cylinder, entailing a loss of heat and energy. April 13, 1905.

9978 30th April, 1904. Improvements in Variable Speed and Reversing Gear. E. M. Preston, of J. Stone and Co., Ltd., Deptford, Kent, and



E. F. Simmons, of 46, Church Road, Richmond, Surrey. This invention relates to the epicyclic class of variable and reversing gear, in which the motion of different members of the gear is arrested to effect the differences in speed and in reversal of motion. There are five figures. Fig. 1 is a longitudinal section in a central plane. The engine shaft, *a*, has the usual alignment tongue of the driven shaft, *b*, fitting within its end, the shaft, *b*, being driven by the flywheel on the end of *a*, and the clutch, *c*, in the usual manner. The shaft, *b*, has a loose sleeve, *d*, on which is mounted a disc, *e*, carrying two or more planet pinions, *ff*, which gear with the pinion, *g*, keyed to the shaft, *b*. The studs, *h*, of the planet pinions are at their other ends fixed to another disc, *i*, which is mounted on another loose sleeve, *k*, to form a continuation of the loose sleeve, *d*, and on the sleeve, *k*, is mounted a brake drum, *l*. The planet pinions, *ff*, also gear with an internal toothed wheel, *m*, which is fixed within, or forms part of, a brake drum, *n*, mounted on another sleeve, *o*. Both sleeves are provided with clutches. The sleeve, *d*, has a clutch, *q*, sliding thereon but revolving therewith by means of a feather, *r*. The clutch, *q*, has jaws, *s*, engaging with similar jaws, *t*, on the hub of the sprocket wheel, *p*. The sleeve, *o*, is also provided with a clutch to engage the hub of the sprocket wheel, *p*, formed of inside and outside friction cones with the part, *u*, sliding thereon and revolving therewith by means of a feather, *v*, the two being kept in engagement by the springs, *x*, mounted on studs on the arms, *y*, which are keyed to the sleeve, *o*. The sprocket wheel, *p*, transmits the power to the road wheels of a motor car. The grooves, *z* and *l*, take fork-ended levers to operate the clutches. The sleeve, *k*, is held in position by means of collars 2 and 3 screwed to the shaft, *b*, and the collar 4 prevents its movement in the other direction. 5, 6, 7, and 8 are liners, while 9 is a bearing to take the end thrust. For high speed, both clutches, *q* and *u*, are connected to the sprocket wheel, *p*, and the whole rotates as one at the speed of the engine. For a slower speed the brake drum, *n*, is arrested, and the wheel, *p*, is clutched to the sleeve, *d*. For reversing, the brake drum, *l*, is arrested, and the wheel, *p*, is clutched to the outer sleeve, *o*. There appear to be a good many parts used to obtain two speeds and a reverse. April 13, 1905.

Patent Specifications Published.

Applied for in 1904.

Published May 4th, 1905.

- 8,023. R. HARRISON. Ignition devices.
- 8,293. A. H. CHERRIER and G. P. J. LION. Intl. combn. engines.
- 8,065. E. CONSTANT. Intl. combn. engines.
- 9,026. J. HETENYI and K. AND F. DEDICS. Explosion motors.
- 9,327. W. J. CROSSLEY and J. ATKINSON. Starting device.
- 9,522. H. S. HELL-SHAW. Friction clutches brakes, dynamometers.

The Automotor Journal, May 6th, 1905.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

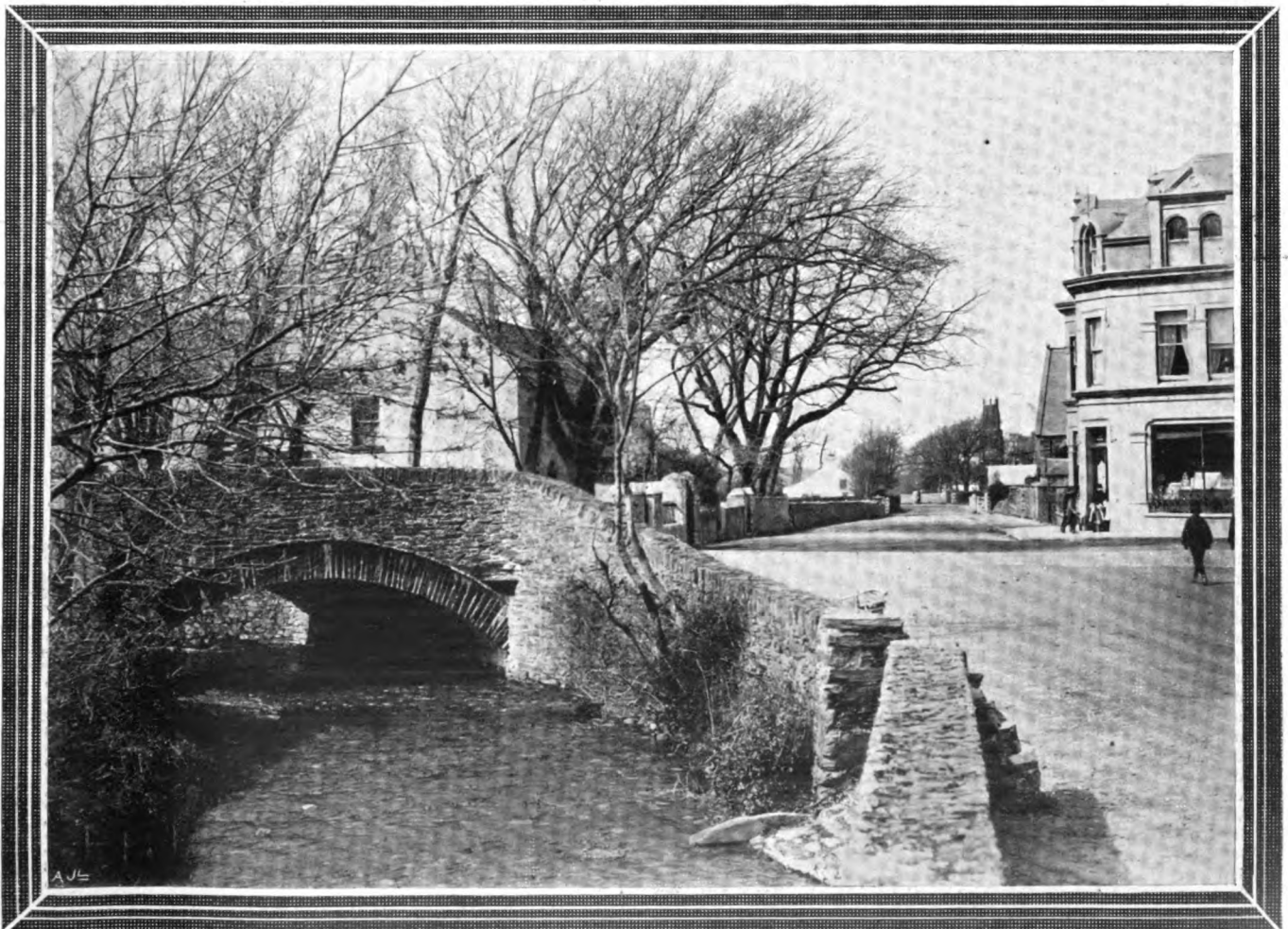
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ISLE OF MAN COURSE.—A picturesque bridge in Ballaugh, which the cars have to cross and then turn to their left.

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DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
May 10-13 ...	Scottish A.C. Reliability Trials.
May 12 or 19 ...	*Quarterly 100 Miles Trials.
May 13 ...	Auto Cycle Club Members' Penalty Run.
May 20 ...	Motor Union Inter-Club Meet (Welbeck).
May 20 ...	200 Miles Trial (Motor Cycling Club).
May 30 ...	*Gordon-Bennett British Eliminating Trials.
May 30 ...	Auto Cycle Trials and "Selection" Race.
June 3 ...	Bexhill Race Meeting.
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.).
June 10 ...	London-Edinburgh (Motor Cycling Club).
June 24 ...	100 Miles Passenger Trial (Motor Cycling Club).
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 4-5 ...	Motor Boat Trials (Southampton).
July 8 ...	Auto Cycle Club Consumption Trial.
July 12 ...	*Hill-Climb (Henry Edmunds Trophy).
July 19-22 ...	*Brighton Speed Races.
July 27-28-29 ...	*Blackpool Motor Meeting.
July ...	24 Hours Run (Motor Cycling Club).
Aug. 11 or 18 ...	*Quarterly 100 Miles Trials.
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 19 ...	*Van Trials, Light and Heavy Vehicles.
Aug. 26 ...	Inter-Team Trial (Motor Cycling Club).
Sept. 9 ...	Brown Cup (Motor Cycling Club).
Sept. 12 ...	Auto Cycle Club Race Meeting.
Sept. 14 ...	*Tourist Trophy (Isle of Man).
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).
Sept. 18-Oct. 3 ...	*Reliability Trials.
Oct. 4 ...	*Speed Trials.

* Automobile Club of Great Britain and Ireland Events and Papers.

Nov. 10 or 17 ... *Quarterly 100 Miles Trials.
Nov. 17-25 ... Society of Motor Manufacturers and Traders Exhibition at Olympia.

Foreign Events (Trials, Races, &c.).

1905.	
May 11-25 ...	Stockholm Automobile Exhibition.
May 13-21 ...	Auto Cycle Club de France Tour.
May 15-17 ...	Italian Tourist Trial (A.C. Milan).
June 16 ...	French Selection Race for G.B.
June 18 ...	International Motor Cycle Cup.
June 20-28 ...	Aix-les-Bains Week.
July 1 ...	Boulogne-Cape Gris-Nez (Motor Boats).
July 5 ...	Gordon-Bennett Race.
July 9-22 ...	Ostende Automobile Meeting.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Calais-Ramsgate (Motor Boats).
July 16 ...	Mont Cenis Hill Climb.
July 20-26 ...	Paris-Trouville (Motor Boats).
July 28 ...	Gaston Menier Cup (Motor Boats).
July 28-Aug. 8 ...	Paris Industrial Vehicles Trials (A.C. France).
Aug. 6-7 ...	Circuit des Ardennes.
Aug. 10-16 ...	Herkomer and Bleichroder Races.
Aug. 11 ...	Anthony Drexel Cup (Motor Boats).
Aug. 12 ...	International Cup for Motor Boats.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Vincenzo-Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.
Sept. ...	Tourist Car Trial (A. C. de France).
Sept. 3-10 ...	Royan Meeting.
Sept. 3-10 ...	Spa Automobile Club.
Sept. 11 ...	British International Cup (Motor Boats Arcachon).
Sept. 12-14 ...	Lake Lucerne Motor Boat Meeting.
Oct. 1 ...	Chateau Thierry Hill Climb.
Oct. 15 ...	Gaillon Hill Climb.

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PASSING EVENTS.

The Inconsiderate Driving Question.

THERE is no doubt about it that inconsiderate driving on the part of the small minority of motorists who indulge in that abuse of power, and the means by which it is to be prevented, are the burning questions of the hour for the automobile movement, and of very great importance to the public generally. The subject has been made acute by the several unfortunate accidents, some of a tragic character, which have recently occurred, and, naturally enough, the daily papers are devoting a considerable amount of space to the subject. The situation, however, has its encouraging symptoms, and as chief amongst them we would note the increased moderation of the non-automobile Press, and the admirable discrimination which it is, in general, now displaying. It is not yet two years—it will only be two years next August—since the outbreak of Juggernautism, which caused the Press of this country to be laughed at by the whole of Europe. Then every motorist was described as a hooligan armed with the latest powers of mechanical development, and practically no distinction was made, with the result that outrages of various kinds on automobilists without respect of persons were chronicled, and we had Sir Ralph Payne Gallwey rushing into the fray with his buckshot proposals. Now, fortunately, though there is considerable public irritation, there is discrimination, and where there is discrimination there is reason and progress. For the daily Press, whether in favour of the automobile movement or against it, are to their credit now recognising that there are drivers *and* drivers, that to be a motor car owner or a motor car driver is not evidence of reckless want of consideration for other people, and that on the contrary the drivers of motor cars who make the highways dangerous to other road users, are more cordially detested by the great body of their brother automobilists than even by the farmers and inhabitants of villages to whom, and to whose children, they have on occasion proved such a source of danger. The recognition of this fact is of the greatest possible importance for getting rid of the evil. While the daily Press was unwise enough to lump all motorists together as public dangers they were naturally inclined to back one another up. Now things are different, and, as a natural consequence, the most effective allies of the police are the respectable, quiet, and steady-driving motorists who have the ultimate future of the movement at heart, and who are always anxious to avoid creating prejudice and hostility by yielding on unsuitable occasions to the fascinations of mere speed.

To Eliminate the Hooligan.

THE result of the satisfactory change in the view of the situation taken by the Press, is that we are now witnessing the most cordial co-operation between the daily Press, the automobile Press, and the Automobile Club, with the view of either eliminating the relatively small number of black sheep who are causing all the trouble, or, what is still better, teaching them to mend their ways. Thus we have the *Daily Telegraph*—the *Daily Telegraph* who, two years ago, it will be remembered, introduced the Juggernaut, and decked him out in all his terrors—devoting a long article to the subject, which, for good common sense and recognition of the important elements of the situation, might have been written by the chairman or secretary of the Automobile

Club. But though the elements of the situation are thus being clearly recognised, the way it should be dealt with presents more difficulties. The Hon. J. Scott Montagu, who is always to the front where the true interests of automobilism are concerned, sums up the situation by observing that the time has come for motorists to protect themselves, and this is in effect the club policy and the club course of action. We referred last week to the re-publication, on April 20th, in the *Automobile Club Journal*, of Colonel Holden's letter, which was circulated about this time last year on the subject, and since then the present chairman of the club, the Hon. Arthur Stanley, has appended his name to a similar circular which contains the same proposals and fully endorses that position. After setting forth what constitute violations of good road manners and behaviour, the circular letter invites everyone witnessing breaches of them, or more serious offences, to communicate with the Automobile Club, who will then deal with the offender, if he is a member of that club, by calling him before the committee, or, if a member of an affiliated club, see that he is dealt with by the club to which he belongs, or generally remonstrate with him if he is an unclubable individual, and belongs to no organisation at all.

The Certificate the Real Lever.

Nor often, however, as we pointed out in our last number, will it be found that the actual owners of motor cars are responsible for the reckless and inconsiderate conduct which gives rise to accidents. "Trouble," as we then said, "is generally caused by paid drivers who are allowed either to take cars home from a distance, or what is still more reprehensible, permitted to take cars out to amuse themselves and their friends without any knowledge on the part of their owners." When the Automobile Club first proposed to establish an organisation granting certificates to drivers, we observed that the advantages conferred both on the drivers themselves, as a body, and car owners and employers, would be such that before long the possession of the club certificate would undoubtedly be regarded as an indispensable requirement by every automobilist employing a paid driver. When this state of affairs arrives, and it is arriving rapidly, the club will be enabled to reduce to a minimum, and probably practically eliminate, reckless driving altogether. There are few owners in the country that are not associated directly or indirectly with the Automobile Club itself, or of some affiliated provincial club, and with them, though the number of them who offend, as we say, is small, the club will be able to deal adequately. With that more frequent cause of accidents, the paid driver, they will be able to deal even more effectively, and more drastically when the club certificate becomes the recognised institution which we hope soon to see it. For a driver to have his club certificate suspended or cancelled, will be to him a more serious punishment than endorsement, and practically equivalent to suspension by a magistrate, and by exercising justly but sternly the power to do this, we feel sure that the club will ultimately be able to prevent thoughtless and reckless action even by the most irresponsible paid drivers, to the great good of the automobile movement, and the elimination of the road hooligan.

But Fairness Essential.

WHEN all these measures have produced their full effect, and when in consequence the reckless driver, the

motor hooligan, and the road hog are all as extinct as the Ichthyosaurus, it is to be hoped that someone will have taken in hand the education of pedestrians also. At present, the pedestrian either legally is, or looks upon himself as being, the "chartered libertine" of our highways. The automotor, the four-in-hand, the ordinary horse-drawn carriage, the farm wagon propelled by *Dobbin communis*, and even the humble donkey cart are all required to keep on the proper side of the road when encountering other traffic. At any rate, if they do not, they are responsible for the consequences. But the pedestrian is under no such obligations.

Now this hardly seems fair, or in accordance with that sacred principle which lies at the root of all jurisprudence, that sauce for the goose should be sauce for the gander. We do not agree with our esteemed but rather technical contemporary *Punch* that pedestrians should be universally compelled to carry headlights in front and rear lights on other parts of their persons, or some such similar arrangement, but we do think that there should be some obligation upon them to keep to the side of the road, and in general to exercise a certain amount of reasonable supervision over their actions.

There has been a great deal of outcry regarding the supposed belief of *all* motorists that they own the highroad. No true motorist thinks anything of the sort, but if he thinks that the highway is intended to *progress* along, that ought not to be regarded as a serious offence on his part. But whatever the motorist may think on the subject, there is no doubt that in certain districts the pedestrian is convinced that the highroad belongs to him, and him only. It is not in accordance with the tendencies of the age that he should in this way be allowed to play the dog-in-the-manger. We are convinced that the future and industrial development of the country are bound up with the extension of reasonably rapid locomotion along our roads. For this to be pleasant and safe for all concerned, the pedestrian must have duties and obligations as well as the drivers of vehicles, and he, too, should be made to observe them.

The Automotor as an Advocate of the Rational.

MORE than once have we drawn attention to the influence which the automobile movement has had in restricting exuberant and excessive indulgence in the silk top hat, which, before the advent of the new locomotion, threatened to become a regular epidemic. People persistently wore top hats upon all sorts of unsuitable occasions, and in all sorts of ridiculous and impossible places. There were even votaries of that ugly, uncomfortable, and unpractical form of headgear who were suspected of sleeping in them. But now that is all changed. The top hat has retired to its proper sphere as a ceremonial embellishment only, and even the King starts for the Continent in a bowler. For this we have largely to thank the automobile movement, and it is producing the same effect in other directions. Less noticeably perhaps, but none the less profoundly, is it modifying feminine methods of dress and personal adornment. It has kept in check the terribly flamboyant tendencies of the last year, and now, with the return of the motoring season, there is a return to the sensible, the practical, and in general, the style of costume which was so admirably portrayed in the picture of "La Belle Chauffeuse" to which we

referred when it was exhibited at the New Gallery. To have your nerves always up to the mark, too, is an essential condition of the capable driver, whether he is an owner or a professional, and there seems to be no doubt that the agreeable excitement and healthy stimulus of rapid movement, and the open-air life to which automobilism has introduced so large a number of the community, is having its effect in diminishing national consumption of stimulants, as is pointed out by Mr. Scott Montagu in the current number of the *Car Magazine*. Whatever may be the positive effects of the movement, however, as a rationaliser and a promoter of the sensible and healthy, its negative tendencies are more decided still. We have recently been threatened with a re-invasion of the crinoline. At any rate, there have been sinister rumours to that effect. The automobile will enable us to defy them. No lady equipped with the crinoline of forty years ago could maintain her seat in a respectable automobile. She would soar aloft and become a permanent airship or a constellation.

The Motor Boat in Real Service.

SINCE the Monaco Motor Boat Races, a good many pessimists have been pulling long faces, and shaking their heads over the motor boat, and pronouncing in doleful tones their fixed disbelief in its capabilities for sea-going purposes. As we observed at the time, it is absurd to draw any such pessimistic conclusions from what happened at Monaco. It was an experiment, and a somewhat dangerous experiment, to employ such racing boats at all in the open sea, as they were admittedly, most of them, designed for high speed in absolutely smooth water, and for that only. But still when accidents happen, people may argue as much as they like, and the bad impression produced will only be dispelled by some exploit which fixes public attention upon it, and at the same time shows that the conclusions to which people have been rushing are too hasty. Circumstances, and Mr. Edge, have provided a demonstration that the motor boat when properly built, manned, and piloted, can be as serviceable and safe on the sea as any craft that ever ploughed the four seas of the British Islands. The sea-going petrol yacht "Napier Major," whose departure on its northward cruise from London we chronicled last week, has successfully completed its run to the Shetland Islands without a mishap of any kind, and this feat it accomplished during a week of quite exceptional storm. When she started, there was a stiff breeze, almost a gale, in fact, blowing from the north-east, and on arriving at her destination she had encountered several days of gale from the north-west and south-west, and the gales were such that many a stalwart fishing smack or steam trawler had to cut and run for it. Though, owing to the weather, an absolute non-stop run was not effected, as they had to take refuge at one port for a short time, and ran into another to procure a mizzeh mast to keep the vessel's head up to the wind, the voyage, in spite of the knocking about, was accomplished practically without a hitch. Now this is a splendid testimonial to the petrol sea-going motor boat, when properly constructed and managed, and it comes with particular appropriateness at a moment when it is calculated to dispel any bad impressions that have been produced by recent occurrences in the Mediterranean. In arranging the tour, therefore, Mr. Edge has deserved well of the motor boat building interests all the world over.

THE LEGROS AND KNOWLES PETROL TOURING CAR.

ALTHOUGH at the time of the Olympia Show—where the first Legros and Knowles chassis was exhibited to the public—it was quite evident that another first-class British-built type of vehicle had made its appearance, yet the manufacturers had not then quite decided upon all the details of design for the standard cars which they intended to place upon the market, and we consequently deferred giving any very full description until these minor points had been settled. Since then, the very exhaustive and careful tests that were being conducted by the firm have been completed, and we are now able to deal thoroughly with the standard touring cars that are being turned out in their Willesden factory, rendering this description thoroughly intelligible to prospective purchasers by the aid of the very complete set of photographs which we have been permitted to take in their works. This new vehicle is—as we have previously been able to mention—well worth the attention of those requiring a really good all-round car for general work, and for touring purposes, for, although it possesses nothing startling in the way of

suggestive of the practice adopted in locomotive design, and almost every portion of the mechanism is so made that it could, if necessary, be replaced without involving any considerable amount of work. On the one hand, the aim has been to avoid all risk of breakdown, but, on the other hand, a very successful attempt has been made to reduce the cost of repair if any part should require attention or replacement.

The works in which these cars are being turned out are extremely well equipped with the best and most up-to-date machinery for the purpose, so that—except so far as castings are concerned—the makers are quite independent of outside assistance, and are therefore able to ensure absolute accuracy of workmanship and to avoid any vexatious delays in awaiting the arrival of component parts. Although not very large, they are well laid out, and are capable of producing a considerable number of vehicles per annum, while an extremely important point that should be mentioned in this connection, is that everything has been done to render certain absolute interchangeability of parts and

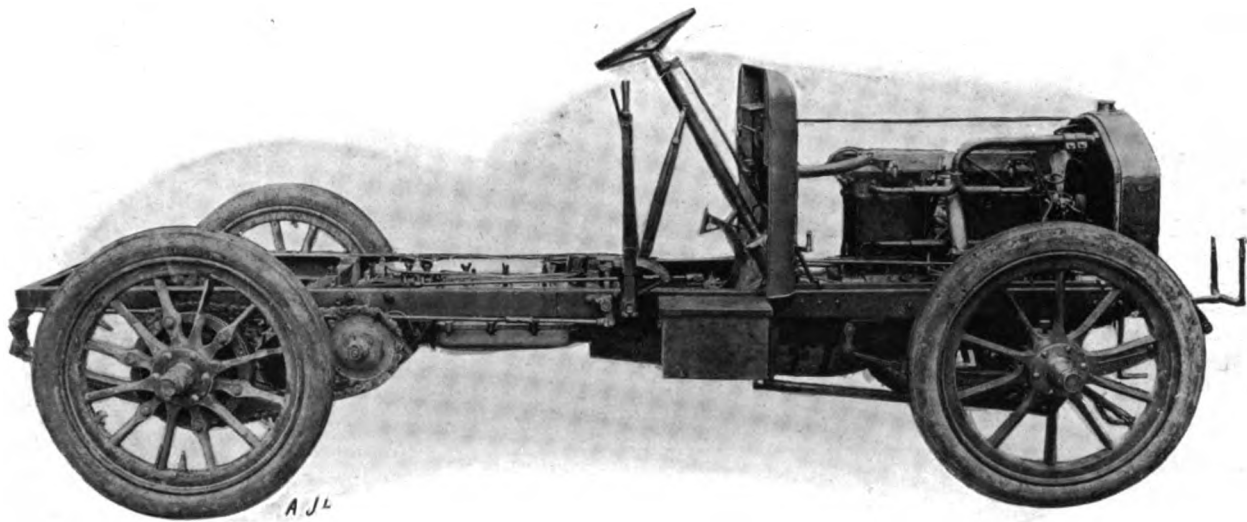


Fig. 1.—View of the 24-h.p. Legros and Knowles Chassis, from the "off" side.

radical departure from the best accepted practice, it has obviously been designed by those who are thoroughly acquainted with what has already been done by other automobile manufacturers, and who possess a thoroughly sound engineering knowledge that has stood them in good stead. Possibly the two characteristics that stand out most prominently are the unusual strength of the entire chassis, and the remarkable facility with which all the vital parts of the mechanism have been rendered accessible from beneath, for both these features are most strongly marked, and are even possessed to so great an extent that a slight sacrifice to lightness has been made in order to ensure them. It must not, however, be supposed that the weight of the chassis is in any way excessive, for, as a matter of fact, it has been kept down with remarkable success in the design of all the chief parts, and it is certain that at the almost negligible sacrifice of about a couple of hundredweight, durability and accessibility have been secured to a very marked degree. The chassis is so substantial as to be

to cheapen the cost of production by avoiding hand labour as far as possible. As an instance of the completeness of the plant, it may be mentioned that all the gear-wheels are manufactured on the premises, and that a special machine tool has been installed for cutting the bevel-wheels and for giving them accurately-shaped teeth, instead of making them in the old-fashioned manner.

The standard car is of that type in which side-chains are employed for driving the rear wheels, and it is fitted with a 24-h.p. four-cylinder engine that runs at a normal speed of 900 revs. per min. The chassis is suitable for taking any ordinary type of touring body, and it has a change-speed-gear that is constructed, in general respects, on Mercedes lines, and provides four forward speeds and a "reverse." The car is quite speedy enough for all ordinary touring requirements, for it is usually geared to run at about 32 miles per hour on the top speed without permitting the engine to run at above 800 revs. per min.

Special Features.

Briefly enumerating, in the first place, the more interesting characteristics of the Legros and Knowles car, it is found that these refer more essentially to the main frame, to the engine, to the brakes and to the steering-gear, and also to the clutch and to the gear-box. The frame is made of pressed steel, with the side members so shaped that they form an underframe—in one piece with the main frame—for the engine. Unusually strong joints can be made between the various members as an additional consequence of this construction, and other advantages are secured, as will be recognised in due course. The frame has the four springs fixed direct to it, instead of to projecting dumb-irons, and the designers make a strong point of mounting them beneath the side members, instead of outside them—to avoid all twisting strains; the springs, too, are fixed beneath, instead of above, the axles. The design of the engine includes so many ingenious features that only a few can be mentioned in this brief preliminary paragraph, but most important of

"timed" simultaneously with the igniters. The engine has no automatic governor; it is normally controlled by a single hand-lever, placed above the steering-wheel, and special provision has been made to ensure effective lubrication from the dashboard. The brakes on the car are all of the same type, having internal shoes which are pressed outwardly against the brake-drums. Their special construction renders them particularly easy to adjust, and to continue adjusting after a considerable amount of wear has taken place, while the shoes are normally held quite clear of the drums when not actually in use. The steering-gear is of the worm and nut type, having abnormally large bearing surfaces, and it dispenses with the usual worm-wheels and toothed sectors commonly employed. The main-clutch has a self-aligning leather-faced cone, and is formed with fan blades inside it. It is normally held in engagement by an external stationary spring, which is conveniently placed for adjustment, and the clutch is connected with the change-speed-gear through a shaft having universal-joints at both ends. An important point in the design of this portion of the mechanism is that the clutch-cone

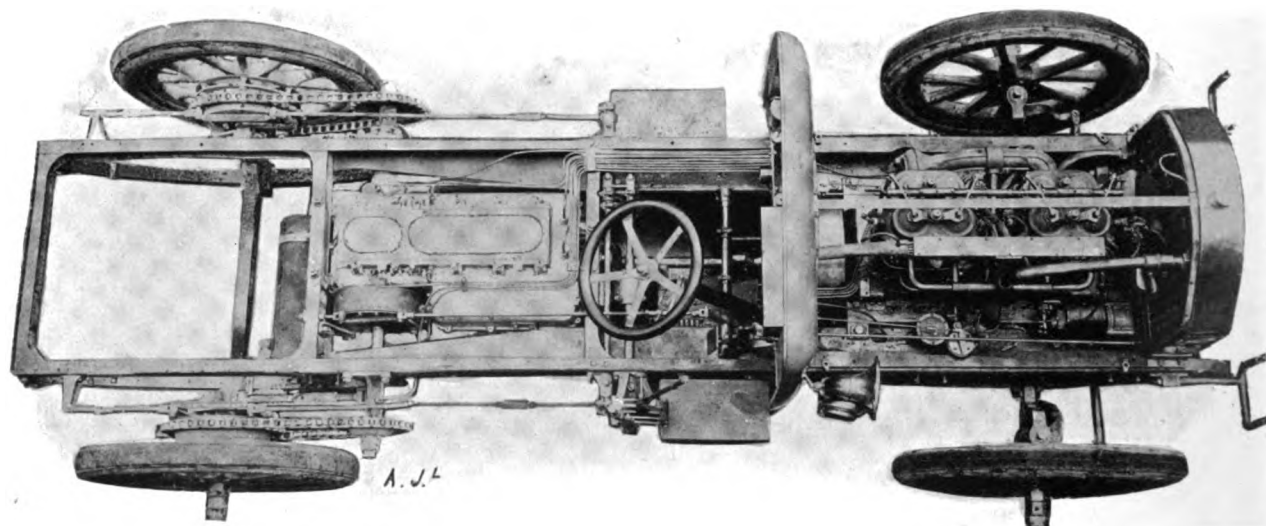


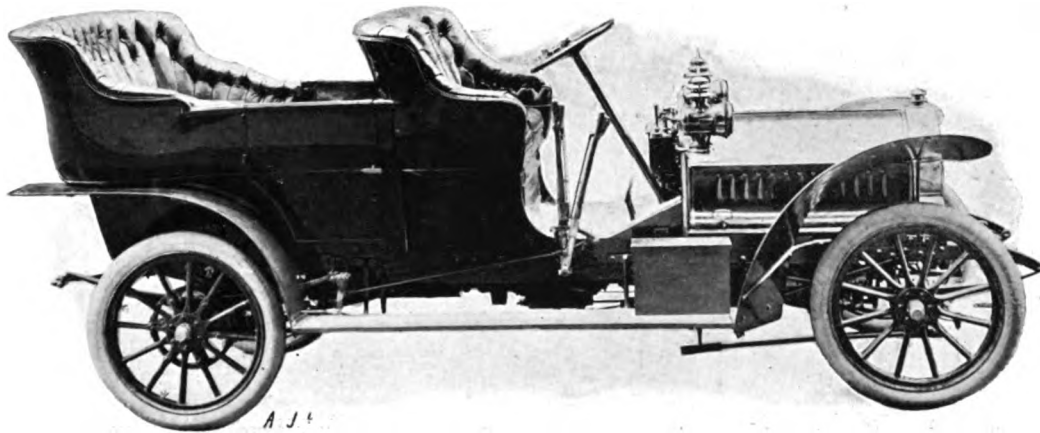
Fig. 2.—View, from above, of the 24-h.p. Legros and Knowles Chassis.

all is the ready accessibility of the chief moving parts. Not only can the entire base be taken down without disturbing any other portion of the mechanism, but the two cam-shafts, together with their bearings, are readily removable, and, further than this, there are two large inspection doors on one side of the crank-chamber through which the "big-end" bearings, and the main bearings of the crank-shaft, can be reached at a moment's notice. The inlet-valves, which are mechanically-operated, and are mounted in special double guides, are fixed centrally above the cylinders, and are held in place by a single nut that serves for each pair of valves. The removal of a valve in no way disturbs the induction-pipe, for this pipe-fitting is bolted to the cylinder-castings quite independently, and is ingeniously employed for the further purpose of forming a casing for the ignition wires. Provision is made for two distinct systems of ignition, both of which are independently "timed," the normal system being of the low-tension magneto type, and the other system of the high-tension type from accumulators; the magneto is

can be readily removed without disturbing the gear-box or the engine, and that a new leather face can thus be fitted quite easily. The gear-box may almost be said to have been designed upside-down, for although it has a very large detachable cover yet the interior mechanism is rendered most accessible by merely removing the entire base. All the bearings and the gear-wheels can then be thoroughly inspected, or even replaced, without even taking up the floorboards of the body. The box itself is fixed to the frame at three points only, and it is made sufficiently large to also enclose the sliding-rod mechanism by which the gears are operated. The bearings are all independently connected with a multiple-feed-greaser on the dashboard, and, in addition to the usual locking devices for preventing more than one speed from being brought into use at one time—and for preventing the "reverse" gear from being inadvertently introduced—there is a locking-pin fitted between the gear-lever and its quadrant to prevent the car from being tampered with when left standing.

(To be continued.)

THE CUPELLE PETROL CARS.



A 12-15-h.p. Cupelle Car fitted with side entrance body.

WE are now able to give particulars of the Cupelle cars, to which reference was made at the time of the last Agricultural Hall Show, where they were exhibited for the first time by Cupelle Motors, Limited (Mr. Fair), for whom they have, we understand, been specially constructed in France. No radical innovations have been introduced in these cars, which have been designed with a view to providing an up-to-date vehicle, constructed on well-tried lines. The complete range of models comprises five different sizes, viz., 10-12-h.p., 12-14-h.p., 12-15-h.p., 16-20-h.p., and 24-30-h.p., of which the first two have twin-cylinder engines, and the others have four-cylinder engines. The engines of the 16-20-h.p. and 24-30-h.p. have the same cylinder-castings as those of the 10-12-h.p. and 12-14-h.p. engines, respectively, and the 12-15-h.p., which is the smallest of the four-cylinder models, has no twin-cylinder counterpart. In general design and construction, the chassis are similar to one another, so that the photographs and description which we give of the 16-20-h.p. vehicle will apply, in the main, to the other Cupelle models also.

The chassis, seen from the side and above in Figs. 1 and 2 respectively, is of the live-axle type, and is fitted

with a gear-box of the sliding spur-wheel type, giving three forward speeds and a reverse; its four-cylinder engine is capable of developing 16-h.p. at 750 revs. per min. The standard frame is of armoured hickory wood, reinforced at the corners with gusset plates, and, except in the case of the smallest car, trussed beneath the side-members. When desired, however, a pressed steel frame can be supplied instead, and in these a very rigid and, at the same time, particularly neat, construction is obtained by welding the transverse-members to the side-members under the action of an oxy-acetylene flame. The frame is carried on semi-elliptic side-springs, those behind—which lie, as usual, outside, instead of beneath, the side-members of the frame—having shackles at their rear ends only. The front axle is a steel stamping of section, and has the forks for the steering-heads bolted to it. The steering-gear is of the worm-and-sector type, and the tie bar connecting the steering-knuckles lies in front of the axle.

The 16-20-h.p. engine, seen from both sides in Figs. 3 and 4, has a bore and stroke of 85 mm. and 110 mm. respectively; the bore and stroke of the 10-12-h.p. and the 12-14-h.p. are 98 mm. and 110 mm., and of the 24-30-h.p. the bore and stroke are

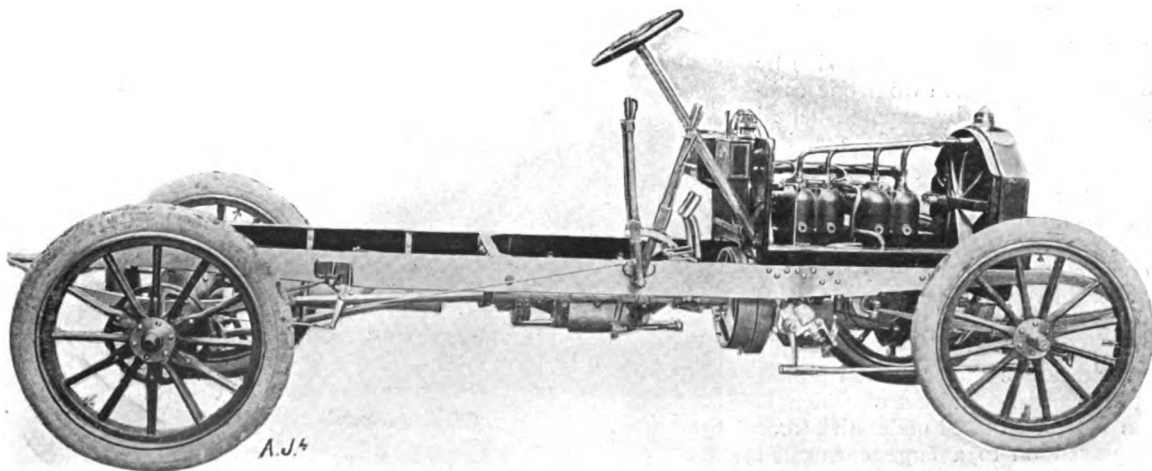


Fig. 1.—View from the side of the 16-20-h.p. Cupelle Car.

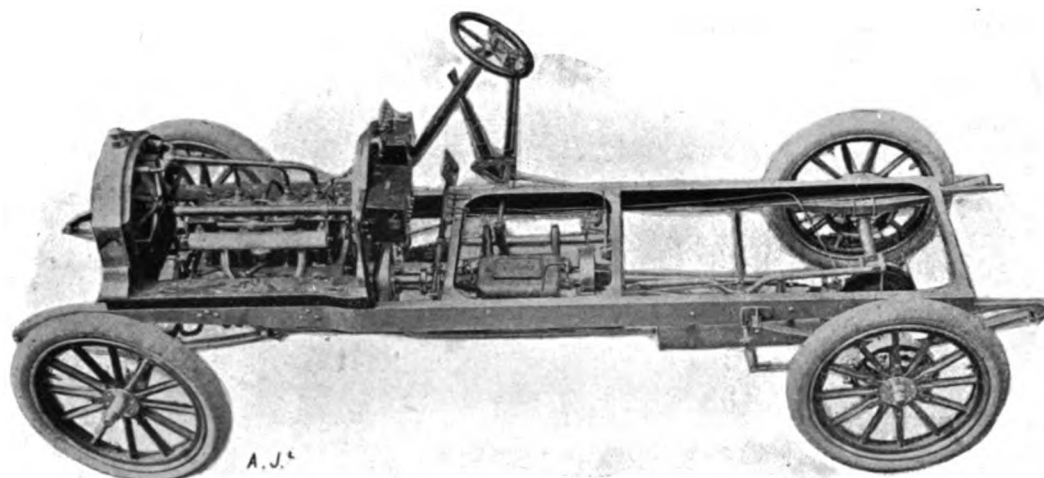


Fig. 2.—View from above of the 16-20-h.p. Cupelle Car, showing the special pressed-steel frame with its welded transverse members.

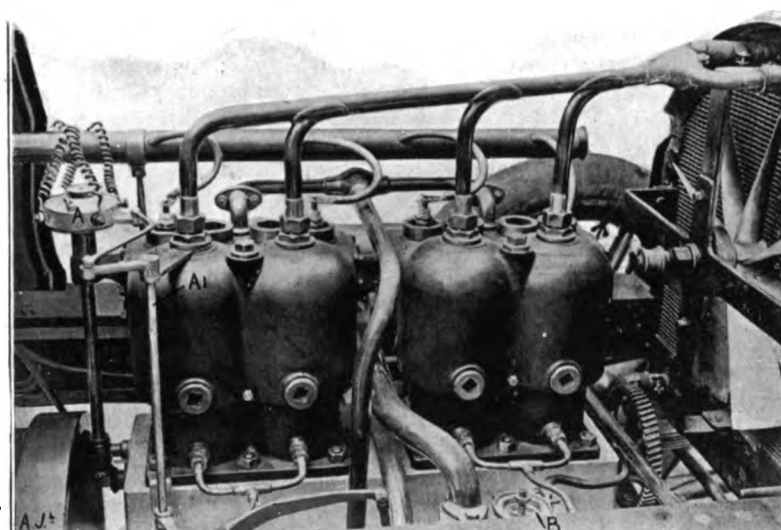


Fig. 3.—View of the 16-20-h.p. Cupelle Engine, showing the automatic valve, B, on the carburettor, and the position of the gear-driven commutator, A, with its timing-rod, A¹.

110 mm. and 130 mm. respectively. The cylinders are cast in pairs, and have their inlet and exhaust valves arranged side by side, so as to be operated from one cam-shaft, which is driven by exposed helical spur gearing situated in front of the engine. The bearings for the crank-shaft are independent of the lower half of the crank-chamber, which can therefore be removed for the purpose of inspecting the big ends of the connecting rods. The carburettor is of the ordinary float-feed type, but is provided with a very simple "automatic" attachment, B (Fig. 3), which admits auxiliary air direct to the induction pipe at high engine speeds. The petrol, which is carried in a tank situated under the front seat, is sprayed on to a large corrugated inverted cone placed immediately below the air-valve, B. This cone forms a partition between the auxiliary air-valve, B, and the

jet, but, both the valve and the cone being easily removable, the jet is very accessible, and is in a convenient position. High-tension ignition from accumulators is employed, but provision has been made for fitting a magneto if desired, in which case the magneto is bolted, either to a bracket on the crank-chamber, or to the frame, and is gear-driven by a spur-wheel situated on the opposite side to that on the cam-shaft. The commutator, A (Fig. 3), for the battery ignition is mounted in an accessible position on the top of a vertical shaft which is gear-driven from the cam-shaft. The cooling water is circulated by means of a gear-driven centrifugal pump, and passes from the cylinder heads to the radiator through an inclined pipe which is branched in order to enter the radiator in two places, and so distribute the water more evenly; a similar branched pipe is used from the

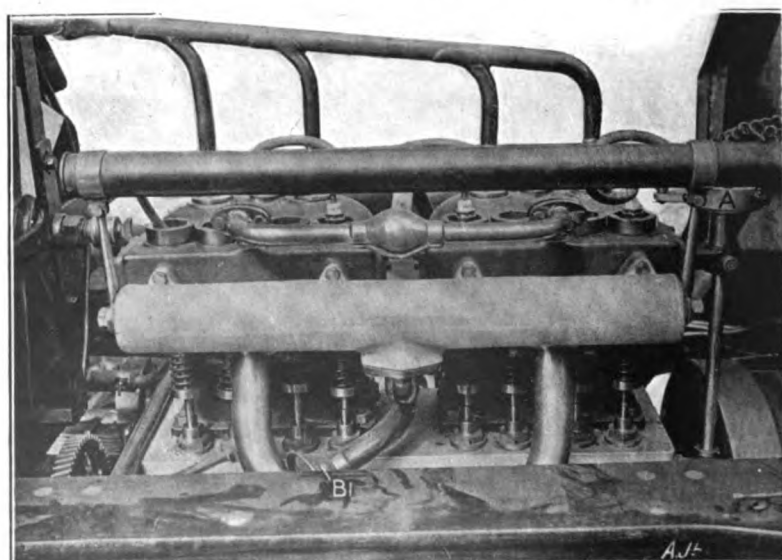


Fig. 4.—View of the 16-20-h.p. Cupelle Engine, showing the inlet and exhaust valves, and the position of the air in-take pipe, B¹, for the carburettor.

radiator to the pump. The radiator, which is cooled by a belt-driven fan, is constructed of numerous fine-bore finned tubes arranged vertically in a neat casing which forms the front of the bonnet. The capacity of the radiator is six gallons, and a separate water tank is unnecessary. The power and speed of the engine are controlled by the driver by means of the "timing" and "throttle" levers which are situated above the steering wheel. An automatic governor is also fitted and is connected up to the throttle-valve, and, if desired, an accelerator pedal can be provided for cutting out the governor, although no such pedal is fitted on the standard chassis.

The clutch is of the external cone type, but the inner member is made in halves so that it may be easily dismantled for re-leathering. The clutch-operating mechanism is interconnected with both the foot and the hand brakes so that the clutch is automatically disengaged when the brakes are applied. The gear-box is constructed of bronze and is carried by a short tubular under-frame which is fixed to two of the channel cross-members of the main-frame. Three forward speeds and a reverse are provided, and on the top-speed, which

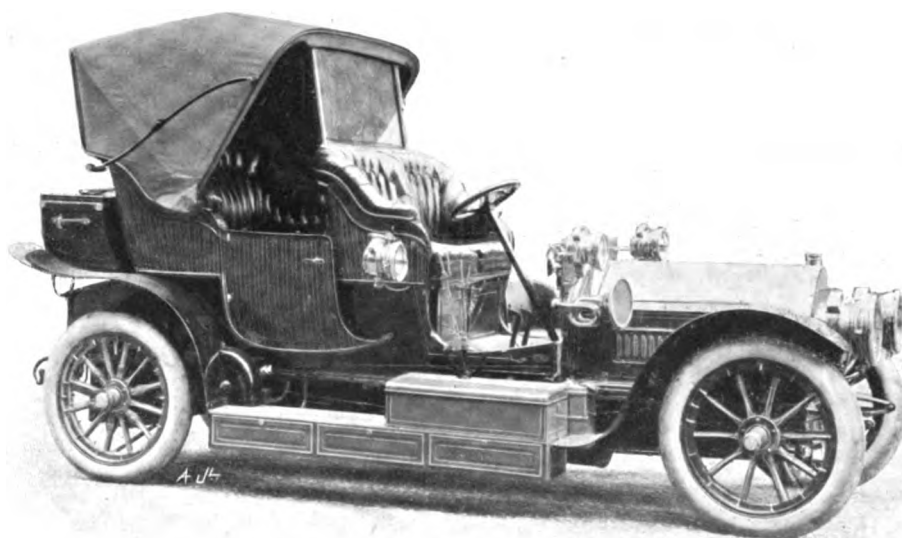
is a direct-through drive from the engine to the live-axle, the lay-shaft is disconnected from the driven shaft, so that it no longer revolves. The gear shafts run on plain bearings, and flexible couplings are fitted at both ends of the exposed propeller shaft. The road wheels run on tubular extensions of the axle-casing and are mounted on ball-bearings. The drive is transmitted through the rear springs which are hinged to the frame at their front ends, but a long spring-suspended rod is attached to the differential casing for taking the torque.

The usual brakes are provided, those on the hubs of the rear wheels, which are operated by hand, being band brakes, and that immediately behind the gear-box, which is operated by foot, being a metal-to-metal shoe brake. The lubrication system is controlled entirely from the dash, and the oil is fed by exhaust pressure to the lubricator, from which, pipes go to the crank-chamber, the gear-box, and the back axle. A separate pump is also fitted for forcing a larger supply of oil to the crank-chamber when necessary.

The wheel base is 8 ft. 1 in. and the track 4 ft. 4 ins., and Michelin tyres of 810 mm. by 90 mm. are fitted to all four wheels.

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A GERMAIN TOURING CAR.



Mr. Arthur Morris's new 35-50-h.p. Germain Touring Car.

THIS particularly well-designed vehicle has recently been supplied by Capt. Masui to Mr. Arthur Morris, who has for the past two years been the satisfied owner of a 20-h.p. car of similar make. The chassis of the car shown in our illustration has a 35-50-h.p. engine constructed on the usual Germain principle, with steel cylinders and copper water-jackets. High-tension magneto (Eisemann system), as well as battery and coil ignition, is provided, and there is a

small charging dynamo which is also intended for use with the electric side lamps. Beside the driver's seat is a swivel lamp for use when reading sign posts, &c., at night; and another refinement is the detachable seat, on a level with the floorboards, for the mechanic. The body work is by Van den Plas, of Brussels, and is finished in green lined with dark green stripes. A khaki hood is fitted to the rear seats, and an adjustable glass screen may be arranged as shown in our photograph.

✱ ✱ ✱ ✱

AN Irish barrister, in opening the prosecution in the case of a motor car accident, was understood to describe the occurrence as a "foul deed." The magistrate mildly objected that this was perhaps introducing unnecessary

prejudice into the case. "Not at all," said the light of the Irish Bar, "it is a hen and chickens, your worship, that have been done to death, and if that is not a 'foul proceeding,' I ask your worship what is?"

SPEED INDICATORS FOR AUTOMOBILES.—PART V.

THE DAVIS SPEEDOMETER.

AN entirely different principle to any which we have hitherto described, has been adopted in the speedometer which has been put on the market by J. Davis and Sons, the well-known mathematical instrument makers. Neither in appearance, nor in action, does this instrument resemble those which have preceded it, for not only is the indicator very unlike the more ordinary dial and pointer type, but the "mechanism" is also quite a radical departure. The complete apparatus consists of two distinct parts, viz., the indicator proper and the "pulsator"; the former consisting of a gauge-glass, and the latter of a small diaphragm pump.

The pump is placed in a convenient position on the car, and is driven by a chain from one of the front road wheels. Its object is to cause a vacuum in the upper portion of the gauge-glass, and thus to enable the speed of the car to be ascertained, by observing the height to which the coloured water—carried in a suitable reservoir

—clearly visible in the lower part of the gauge-glass—is indicating a speed of just over 25-m.p.h.

The indicator proper which consists of the gauge-glass, B² and the scale, A¹, is mounted above the top of the reservoir, B, and is enclosed in a thick glass case, A. The scale, A¹, is fixed to vertical brass rods, A³, which screw into the cover, B¹, and the cap, A², which is fastened to the rods, A³, helps to keep the whole indicator rigid. The gauge-glass itself passes through a hole in the cover, B¹, and projects almost down to the bottom of the reservoir, B. Passing through the reservoir, and up inside the gauge-glass, B², is a brass pipe, E. The upper end of this pipe is fastened to the cap, B³, which seals the top end of the gauge-glass, B², but there is a small hole, E³, which allows the pipe, E, to be always in communication with the interior of the gauge-glass. The lower end of the pipe, E, is joined to a flexible pipe, E¹, which connects it to the pipe-union, C⁶, on the cover, C², of the pump-chamber casting, C. The object of the pipe, E, is to enable the vacuum, created in the flexible pipe, E¹, by the pump, to take effect in the gauge-glass. The result of the vacuum is to cause water to rise in the glass, and it is, therefore, necessary to ensure that the orifice of the suction-pipe, E,

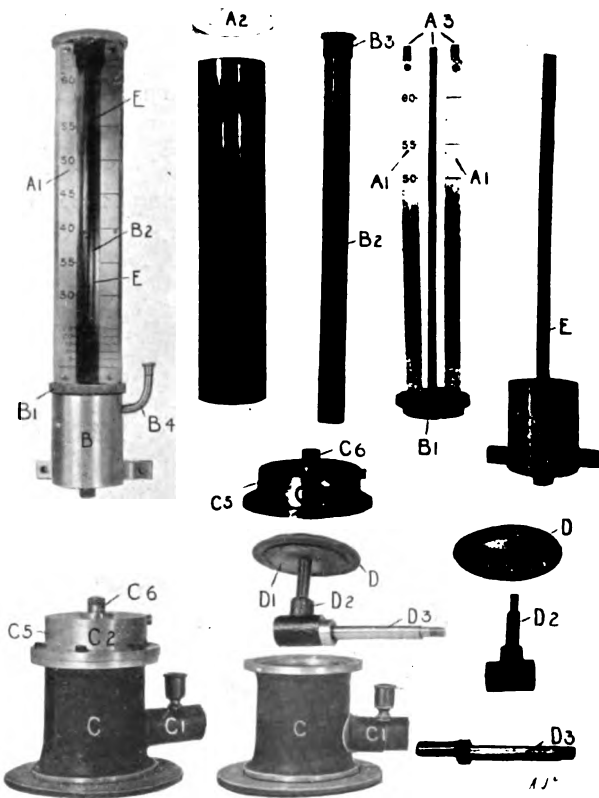


Fig. 14.—The Davis Speedometer. Views showing the instrument complete (on the left), together with its principal component parts. In this illustration neither the driving gear for the pump, nor the flexible pipe connecting the indicator with the pump, are shown.

—ascends in the glass. A scale, calibrated in miles per hour, is, of course, fixed permanently against the gauge-glass, so that the motorist can see at a glance the speed of the vehicle in which he is travelling. The pump, which is virtually an air pump, is of very simple construction and has no valves of any description. Its action on the gauge-glass is indirect, and the principle on which it works is similar to that commonly used in scent sprays; where a current of air passing across the open end of a fine tube dipping into the liquid, creates a vacuum in that tube and so causes the liquid to rise in it.

The apparatus, and its component parts, are shown in Fig. 14; while a sectional line drawing, demonstrating the construction of both the air-pump and the indicator, is given in Fig. 15. On the left of Fig. 14 the apparatus is shown complete except for the driving-gear, and for the intervening length of flexible pipe, which normally joins the indicator with the pump shown beneath it. The coloured water

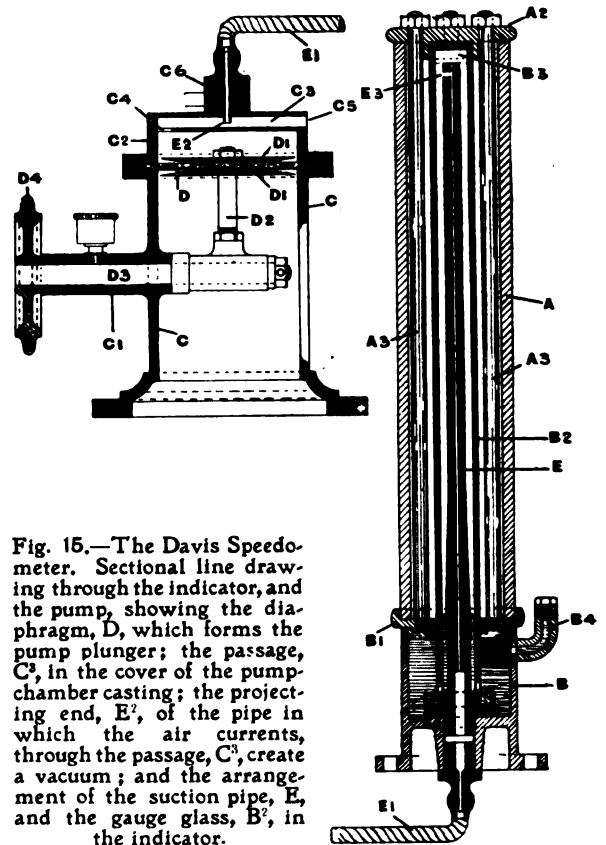


Fig. 15.—The Davis Speedometer. Sectional line drawing through the indicator, and the pump, showing the diaphragm, D, which forms the pump plunger; the passage, C³, in the cover of the pump-chamber casting; the projecting end, E¹, of the pipe in which the air currents, through the passage, C³, create a vacuum; and the arrangement of the suction pipe, E, and the gauge glass, B², in the indicator.

shall always be well above the water-level; hence the position of the hole, E³, at the top of the pipe.

The water, which is coloured for the purpose of rendering it more easily visible in the gauge-glass, is contained in an aluminium vessel, B, forming the base of the indicator. This reservoir, B, is filled with the coloured water until the level of the liquid is at the zero mark on the scale, A¹. The zero mark, however, is above the top of the reservoir, and in order to easily obtain the necessary water-level, the reservoir is fitted with a small pipe, B⁴, which rises, above the cap of the reservoir, to the level of the zero mark on the scale. By this means an exact zero water-level may be easily obtained.

The pump mechanism is of very simple and ingenious construction. The pump-chamber casting, C, is fitted with a detachable cover, C², seen in section in Fig. 2. Gripped between the flange of the cover, C², and the corresponding flange on the pump-chamber casting, C, is the rubber diaphragm, D, which takes the place of a pump-plunger. A large washer, D¹, is fitted on both sides of this diaphragm, for the purpose of affording a secure fastening to the

pump-rod, D². The pump-rod, D², is operated from a crank-shaft, D³, carried by the bearing, C¹, in the pump-chamber casting, C, and the crank-shaft itself is fitted with a sprocket-wheel, D⁴, and is driven from one of the front road wheels of the car. The throw of the crank is only about $\frac{1}{4}$ inch, so that the motion of the diaphragm is quite small. On the upward stroke of the pump a small volume of air is discharged into the atmosphere through the passage, C², formed in the top of the cover, C², and during the down stroke a similar volume of air is drawn in again. The passage, C³, communicates with the space above the diaphragm, through the hole, C⁴, and with the atmosphere, through the orifice, C⁵. Projecting slightly into the passage is the end of a fine-bore pipe, E², which communicates with the flexible pipe, E¹, and the more or less rapid ebb and flow of the air-currents across the open end of the pipe, E², creates a vacuum in the pipe which is proportionate to the rapidity of these air currents, that is to the speed of the car.

It is interesting to note that the pulsations of the air do not in any way affect the steadiness of the vacuum maintained in the pipes,

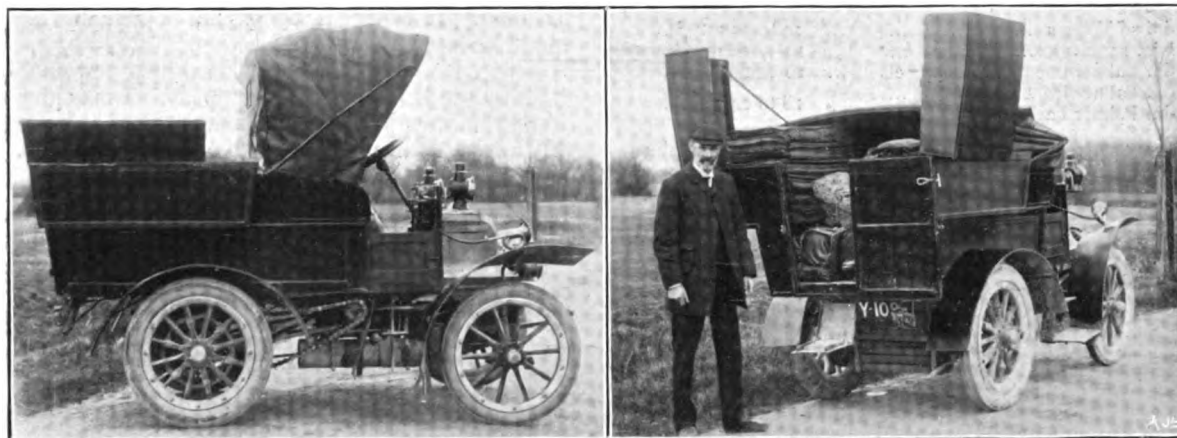
so that the water, which rises in the gauge-glass immediately any vacuum is formed, remains quite steady directly the speed of the pump becomes uniform.

Table of Reference Letters for the Davis Speed Indicator.

A. Glass case.	C ⁴ Hole communicating with C ³ .
A ¹ Scale.	C ⁵ Orifice of C ³ .
A ² Cap on A.	C ⁶ Pipe union on C ² .
A ³ Rods supporting scale.	D. Diaphragm of pump.
B. Reservoir.	D ¹ Washers on D.
B ¹ Cap on B.	D ² Pump-rod.
B ² Gauge-glass.	D ³ Pump crank-shaft.
B ³ Cap on B ¹ .	D ⁴ Ch-in sprocket on D ³ .
B ⁴ Overflow pipe.	E. Suction pipe.
C. Pump chamber casting.	E ¹ Flexible-pipe-connection to pump.
C ¹ Bearing for pump crank-shaft.	E ² Projecting end of E ¹ .
C ² Detachable cover for C.	E ³ Hole in top of E.
C ³ Passage in C ² .	



THE IMPORTANCE OF LARGE TYRES FOR SPEED.



Mr. Robert E. Gibbons and his trusty Daimler Car, with which he has covered so many miles on behalf of the business house he represents. It was this car on which Mr. Gibbons made his experiments, finally resulting in the selection of large-sized tyres as being most suitable for his work.

THAT the automobii forms the ideal means of progression for the present day commercial traveller, is a point on which we have invariably insisted. No better evidence of its enormous value in this respect, and the immense amount of ground and consequently increasing business which it can enable a commercial traveller to cover, could be asked for than that provided by the interesting communication which we append below. Mr. Robert Gibbons has for the last four years had an old 2-cylinder Daimler car in regular action, and during all this time he has averaged about 300 miles a week, making a total distance run of some 70,000 miles. An interesting feature which emerges from his experience is the enormous improvement in speed, as well, of course, as comfort, that the use of sufficiently large tyres places at the automobilist's disposal. When he first started with his car it was equipped with 2-inch solid tyres, and the average speed he was able to attain varied from 12 to 14 miles per hour. Increasing the size of his solids to 2 $\frac{1}{2}$ inches, he got up to 18 miles per hour, while on putting 4-inch pneumatics on all wheels, 20 miles per hour became his top speed, and increasing the same tyres by an inch on the back wheels has enabled him to reach a speed of 24 miles per hour, all this be it remembered with the same car and the same engine, the

only difference being in the size of the sprockets employed. The result is an eloquent testimonial for the value of the large-sized tyre as well as to the reliability and durability of the Daimler Company's engines and chassis, even as built upwards of four years ago.

Mr. Gibbons' communication is as follows:—

It is a surprise to me that motorists fail to appreciate the great advantage to be derived from the use of large pneumatic tyres on their cars. I travel in all weathers, and average over 300 miles per week all the year round. I have personally driven my present car upwards of 70,000 miles during the past four and a half years. I go over the same roads every two months, and have kept an accurate daily record of the time occupied between towns, also of petrol consumed, expenses, &c. My car with load of samples weighs 37 cwt., 24 cwt. of which is on the driving wheels.

I commenced with 2-in. solid tyres, and after three months had much trouble through tyres coming off.

I tried three different makes, but lost so much time through tyre troubles that I had new wheels built to take 2 $\frac{1}{2}$ -in. solid tyres. These were a little improvement, but not much.

About fifteen months ago I decided to try 4-in. Palmer cord pneumatic tyres. I anticipated more trouble, but

hoped to gain in comfort and speed. Contrary to my expectations I lose very much less time with tyre troubles now I have pneumatics than when I used solids, and the difference in speed is remarkable.

I increased the gear of my car 20 per cent., and even then could easily get up hills which previously I could not possibly mount without putting on smaller sprockets, which I always carried for emergencies.

After some time one of the driving tyres gave some trouble, and the Palmer Tyre Company advised me that a larger size should be used for such a heavy load, so I had a duplicate set of driving wheels built to take 5-in. Palmer cord tyres.

I have never had a puncture or any damage to the fabric of the 5-in. tyres, which have run nearly 8,000 miles with this heavy load.

An analysis of the times occupied taken from my records is very instructive, and proves conclusively the advantage in employing large tyres:—

With the Same Car, on Same Roads, Same Driver, and Same Load.

2-in. solid tyres	12 to 14 m.p.h.
2½-in. solid tyres... ..	14 „ 18 m.p.h.
4-in. Palmer pneumatic all wheels	16 „ 20 m.p.h.
4-in. Palmer front wheels	} 18 to 24 m.p.h.
5-in. Palmer back wheels	

Every two months I run from Reading to Burnham,

via Devizes, Bath, Bristol, and Weston-super-Mare, a distance of 115 miles. My records for this run show:—

2-in. solid tyres	10 hours.
2½-in. solid tyres	9 hours.
4-in. Palmer pneumatic, all wheels	7 hours.
4-in. Palmer front wheels	} 6 hours.
5-in. Palmer driving wheels	

When I used solid tyres, sideslip was a serious trouble, and over wet setts and greasy roads I had to travel very slowly. With pneumatic tyres I find practically no trouble from sideslip, and I very rarely reduce my speed on account of bad roads.

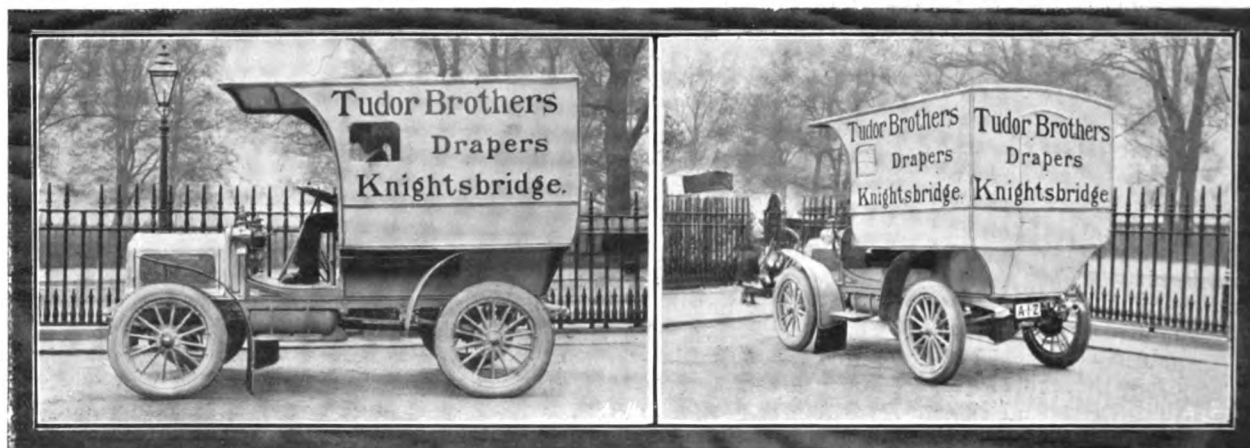
As regards consumption of petrol, I find I use just under one gallon per hour during which the engine is running, whatever tyres are used, but as the distance covered with pneumatic tyres in a given time is so much greater, a very considerable saving results. Besides the increase in comfort and saving in time, I find my repairs to the car are reduced to about one half since I have used pneumatic tyres.

I enclose photos of my car, which is an old two-cylinder Daimler. It is called 6-h.p., but it actually develops about 10-h.p. with electric ignition.

This car will shortly be replaced by a new one, being built by the Bristol Motor Company. I may give some further information as to my experience at a future time. My advice to all motorists is to employ large tyres.



A STEAM DELIVERY VAN.



The new 15-h.p. White Steam Delivery Van.

FOR heavy commercial vehicles, steam had things all its own way from the commencement, though the heavy petrol lorry has for some years been competing with it very successfully. But for lighter commercial work, we have so far seen the field occupied almost entirely by the petrol engine, with the exception of a small number of steam and electric vehicles. It is of interest, therefore, to find that the new 15-h.p. White chassis, which is associated in most people's minds almost entirely with successful touring vehicles, is now being employed for commercial purposes, with a delivery van body having a capacity of 110 cubic feet, and a load limit of one ton.

The delivery van, of which two views are given above, has been supplied to Messrs. Tudor Brothers, at Knightsbridge, this being the first occasion on which the *larger* type of White chassis has been employed in this country for commercial purposes, though Messrs. Liberty and Co. have had some of the 10-h.p. chassis similarly fitted, which have been running for over a year, and continue to do their day's work as expeditiously as ever. A detailed description of the 15-h.p. White chassis, with all the latest improvements which have been introduced, appeared in THE AUTOMOTOR JOURNAL for December 10th and 17th, 1904.

THE BRADLEY AUTOMATIC CARBURETTOR.

THIS carburettor—which is the design of the inventor whose clutch we described in a recent issue—is not only of extremely simple construction, but has been found to give unusually good results on the engines to which it has been fitted. It is naturally difficult nowadays to speak definitely as to the relative merits of different automatic carburettors, since it would be only possible so to do by obtaining and giving somewhat complicated tables of figures relating to actual tests conducted under similar working conditions. Primarily, the best carburettor would be that which would enable an engine to give the highest power that is possible at a number of

which exhaust gases are led by the pipe-fittings, A² and A³.

In order to keep the suction in the mixing-chamber, C, constant, an auxiliary air-valve, E—which is normally held down on its seat by gravity alone—is introduced as seen in Fig. 2. The weight of this valve is sufficient to keep it closed until the suction in the mixing-chamber has attained the degree required, and then the valve opens to just such an extent that the atmospheric pressure beneath it prevents it from again closing. It will thus be seen that the position of the valve, E, will vary in accordance with the quantity of mixture *per minute* that is being drawn by the engine through the port, D, and it will be realised that the actual quantity of petrol that is needed *per minute*—in order to maintain a constant richness of mixture—will also vary with the position of that valve. For these reasons the valve, E, carries a long needle-valve, B³, that passes up through its stem, E¹, and thus the effective area of the orifice in the jet, B², can be made to vary proportionately with the amount of air that enters, provided that that portion of the needle-valve which fits inside the jet is suitably shaped.

Such then is an explanation of the action, and a description of the construction, of the essential features of this very effective carburettor. In this connection, it only remains to be pointed out that, since the velocity of the air past the jet, and the suction acting upon the jet, are kept constant, the amount of petrol which will pass through it per minute must be absolutely proportional to the effective area of the orifice, and that consequently any difficulties that are apt to arise in any such carburettors, owing to the differences that there are between the laws governing liquids

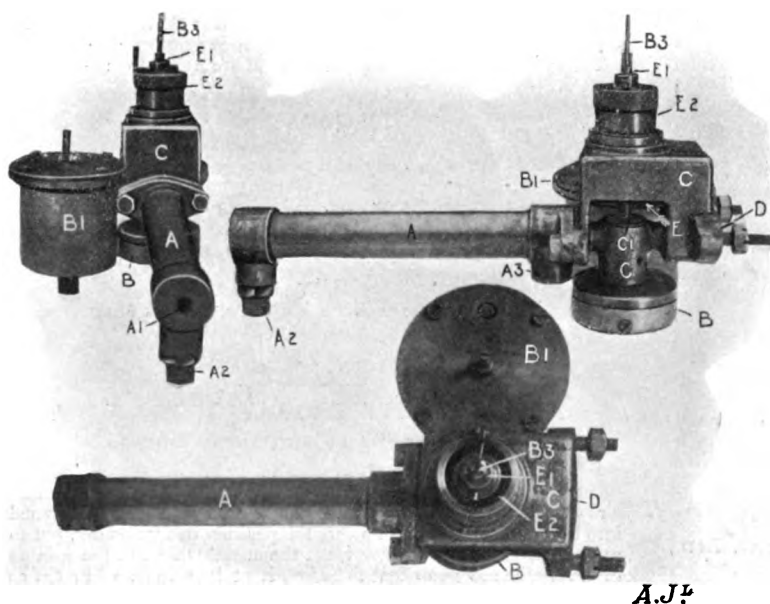


Fig. 1.—Views from the end, from the side, and from above, of the Bradley Automatic Carburettor.

different speeds within the range at which it is capable of running usefully. With most "automatic" carburettors that are now made it is possible to adjust them so that they give the best results, in this respect, over one portion or another only of that range, so that in order to make any such comparison as that suggested, it would be necessary to know how far practical results deviated from ideal results—over the *entire* range. Secondly, of course, the question of fuel consumption under ordinary running conditions—which involves working at constantly varying loads between zero and maximum possible "torque"—is of importance, if a true idea is to be obtained of relative merits.

In the Bradley carburettor, which is shown from three different points of view—from photographs—in Fig. 1, and the construction of which is shown sectionally in Fig. 2, only as much air as is required by the engine, when running at its lowest speed, and when giving its minimum "torque," is allowed to enter through the pipe, A¹. The actual quantity of air that can pass this way depends upon the degree of suction in the induction pipe (and therefore in the mixing-chamber C) so that if this suction be kept constant, at all times, then the air that passes the jet, B², will do so at a constant rate. The pipe, A¹, is fitted with a heating jacket, A, to and from

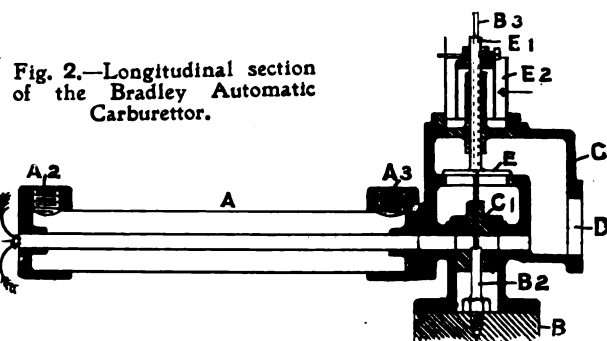


Fig. 2.—Longitudinal section of the Bradley Automatic Carburettor.

and those governing gases, are to a very great extent eliminated by this device.

The level of the liquid in the spray-jet, B², is, as usual, maintained constant by the float in the chamber, B¹, which lies alongside. It will be noticed, also, that an oil dash-pot, E², is fitted around the top of the valve-spindle, E¹, in order to prevent the valve, E, and the needle, B³, from "hunting." There is, too, a guide-block, C¹, introduced around the jet, B², and the needle, B³, to steady the latter, and to restrict the area of the air passage across the orifice of the former.

CORRESPONDENCE.

* * *The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.*

CYLINDER LUBRICATION ON MODERN CARS.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—From the correspondence which has appeared in your recent issues under the above heading, it is apparent that the De Dion system of lubrication is not generally known.

The De Dion twin cylinder engine has an oil reservoir bolted to the water-jacket with pipes (through which the oil falls by gravity) leading to the main bearings of the engine. From the main bearings the oil finds its way to the end of the connecting-rods through the crank-shaft, which is drilled for this purpose, is thrown into the cylinders, and then falls into a receptacle at the bottom of the crank-case. A pump, driven from the cam-shaft, forces the oil back into the reservoir, upon which there is a glass gauge to indicate the amount of oil which is in the engine. The reservoir should be filled to within half an inch of the top of gauge, when the engine is running. This is sufficient for 250 miles, although a charge from the hand-pump (fitted to the dashboard in connection with an auxiliary oil-tank) every 50 miles maintains the oil in the running-tank up to its proper height. If more oil than the engine requires is forced into the crank-case, it finds its way out through an overflow pipe in the running tank.

In the four cylinder De Dion engines, the lubricating oil is forced into the bearings by a similar pump to that fitted on the twin-cylinder engines, the reservoir being at the bottom of the crank-case, with overflow plugs to determine the correct height. When once filled there is sufficient for at least 200 miles, and the amount of oil can be maintained at its full level by means of a pump connected to a reserve tank as on the twin-cylinder motor. When the oil drops down into the receptacle at the bottom of the crank-case, it is strained through gauze before it is pumped again into the bearings. With this system it is impossible for the motor to smoke, and during the 5,000 miles I have driven one of these cars, I have never had a sooted valve or sparking plug.

All the De Dion gear-boxes, with the sliding-pinion type of gear, are fitted with a force-pump driven by a worm from the main shaft which forces the oil from a gauze-protected receptacle at the bottom of case through channels to the various bearings, and through holes in top of gear case on to each set of wheels.

Yours truly,

DE DION BOUTON, LTD.,
J. W. STOCKS,
Manager.

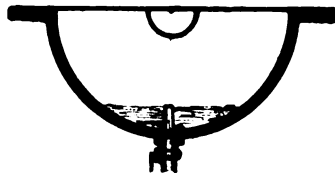
10, Great Marlborough Street, W.,
April 27th.

REFERRING to Mr. Edge's communication on this subject, which appeared in our correspondence columns recently, we are now able



to reproduce a photograph showing the draincocks on the base-chamber-casting of a Napier engine. In addition to the photograph, for which we are indebted to Mr. Edge, we have prepared a sectional drawing, which shows how the overflow pipe, communicating with the cocks, projects up inside the crank-chamber to the required level of the oil.

The cocks are all interconnected by a rod, visible in the photograph, and are operated simultaneously by a handle on the dash, so that it is unnecessary to get underneath the engine in order to drain off any superfluous oil from the crank-chamber.



PREVENTION BETTER THAN CURE.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Police on the Brighton Road.—From the letters appearing in the Press it is certainly gratifying to us to realise that motorists who have been making use of the Brighton Road recently have derived benefit from our scheme of sending out cyclists on the road to caution motorists proceeding at an illegal speed.

We may say that we have received a considerable number of letters from users of other roads round London, requesting us to undertake the organisation of patrolling the main roads out of London in a similar manner. Whilst wishing to do everything in our power with this object, at the same time we would point out that the matter is one entirely in the hands of the users of the roads themselves. If readers of your paper would communicate with us we would be only too happy to render every assistance in our power for the purpose of organising and putting the scheme into proper and permanent form.

Some misunderstanding seems to exist as to our reasons for employing cyclist patrols on the Brighton Road, and we would like to repeat what we have previously stated, namely, that it is greatly to the benefit of the industry at large—including the trade and the private owner—as well as the general public, that justice should be dealt out fairly. Great injustice is done to a large number of very considerate and careful drivers by the harsh methods adopted by the police, and we formulated our scheme with the sole idea of demonstrating that considerate driving can be secured, and fast driving discountenanced, by having cyclists on the road, who are competent judges of speed, to warn motorists travelling at an illegal speed, and thus relieve the police of their very unpleasant duties, and at the same time save the driver an expensive police court experience.

The instructions to our men on the road are as follows:—

“Your instructions are to warn all drivers of motor cars on your particular section against travelling at a speed exceeding the legal limit.”

Our object is not to do away with police traps but to render them unnecessary.

Anyhow, our experiment was made for a period of one month, and if it is the wish of users of the road that the scheme be carried on and enlarged, and they will communicate with us, we will be pleased to render every assistance.

Yours faithfully,

CHARLES JARROTT AND LETTS (LIMITED).
45, Great Marlborough Street, W.
April 29th.

TOURIST TROPHY RACE.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—While you, in common with nearly all of the technical and other Press, have given a great deal of attention to the Tourist Trophy, and while its importance and excellence have been dinned into the public ear, I think it would possibly be interesting, not to say useful, to present the reverse of the medal which, in the opinion of many who are competent to judge, is at least in as bold relief as the obverse.

The conditions which govern the contest are so arbitrary and depart so far from present practice, as to entirely stultify its existence.

To begin with, take the petrol consumption—this is limited to one gallon per 25 miles of give-and-take road, with the object of stimulating manufacturers to obtain better carburation, a laudable ambition; but, and there is a but, though there is certainly room for carburettor improvement, there is not all that difference to be obtained, so that manufacturers will be driven to obtain economy in other ways. They will revert to the hit-and-miss governor instead of a throttle, and to the constant-speed engine. These both tend as highly to appreciate a car from the economical point of view, as they tend to depreciate it from the point of view of a perfect touring car. Everyone nowadays wants a flexible engine and no gear-changing. The regulation will give us a constant-speed engine and as many gears as can be got into the weight of the chassis prescribed, for there does not at present seem to be any room for revolutionary change in carburettor efficiency. And while on the subject of petrol consumption, let us guard against a very possible change of front on the part of the controlling authorities; when they find that there is a general feeling that 25 miles to the gallon is too much, they may possibly alter the regulation. If they do, it must be stopped at all costs, in fairness to those who have achieved the standard now required.

The weight regulations are no more intelligent from the point of view of the ideal touring car. A minimum weight of chassis will probably conduce more to length of life in tyres than to length of life of the car as a whole, and in any case this can only produce one type of car of doubtful merits. When restrictive clauses are made for such a competition, consideration should be given to what type they aim to produce (the yachting experts could tell that changes in the rating rule produce vastly different types of craft), and the question should be looked at from all sides.

Though, as a rule, I am not a betting man, I should not mind making a wager that the trophy will be won by a high h.p. car,

with governing arrangements which will reduce it to the level of a freak compared with an up-to-date automobile. The makers will, no doubt, find it worth their while to make such a freak for the advertisement to be gained, but I do not expect they will make any others for customers, but will revert to the standard model which, no doubt, will be a great deal nearer the perfect carriage than the car that wins the race.

It is a pity that no more thought was employed before the regulations were finally decided on, and it is not too late to hope that another year such a genuine chance of "improving the breed" should not be lost.

Yours faithfully,
G. KNOWLES.

Cumberland Park, N.W., May 2nd.

THE SHOW QUESTION.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I have noticed in the motor Press recently two letters *re* the question of Automobile Exhibitions from the pen of Mr. W. M. Letts.

In Mr. Letts' last letter he takes the opportunity of writing to say that Messrs. Charles Jarrott and Letts, Limited, are fully convinced that it would be a great mistake for them to undertake not to exhibit at any Exhibition other than the Motor Traders' Exhibition in November next before the 31st October, 1906, and that they have decided not to sign the bond, nor will they apply for a space at the Olympia Show.

Inasmuch as Mr. Letts has chosen to make the action of Messrs. Charles Jarrott and Letts, Limited, more or less a public matter, it is only fair to call attention to one or two facts in connection with the action of Messrs. Charles Jarrott and Letts, Limited, concerning which Mr. Letts has made no mention.

I think it is common knowledge that the firm of Messrs. Charles Jarrott and Letts, Limited, handle particularly three makes of cars, *i.e.*, the Oldsmobile, the De Dietrich, and the Crossley. Without asking any impertinent questions of Messrs. Charles Jarrott and Letts, Limited, or making any assumptions which would be unwarranted, I think it is fair to assume that their business in Oldsmobile cars and De Dietrich cars combined, is of equal importance, if not of greater importance, than their Crossley business. This being the case, it is extremely interesting to note that the Oldsmobile Company of America, and the De Dietrich Company of France, have each signed the bond of the Society of Motor Manufacturers and Traders. Moreover they have each applied for space at the Olympia Exhibition in November next, through Messrs. Charles Jarrott and Letts, Limited, acting in the capacity of agents of each of the two firms mentioned.

These facts speak for themselves. We will say, for the sake of argument, that Messrs. Charles Jarrott and Letts, Limited, have three departments in their business. As to two of these departments the bond is signed and the space in the show applied for. For the one remaining department, Messrs. Charles Jarrott and Letts, Limited (through the medium of Mr. Letts personally), inform the motor public that the firm of Charles Jarrott and Letts, Limited, will have none of the bond, and put forward arguments which would have a tendency to make others follow what one upon first sight might think to be the policy of Messrs. Charles Jarrott and Letts, Limited, but which, in view of the facts set forth in this letter, appeals to me as being a movement of a slightly different complexion.

I thoroughly appreciate and admire cleverness wherever it may be applied, and hence I compliment Mr. Letts and the firm of Charles Jarrott and Letts, Limited, upon having a business so constituted

that they can show the majority of the cars which they have for sale at the Show of the Society of Motor Manufacturers and Traders at Olympia, and thus gain the benefit of that Show, and at the same time pose as champions of the non-bond signers, and show the goods of another department of their business at the Agricultural Hall Show and the Crystal Palace Show. Most of us who have signed the bond, however, have signed it in the spirit as well as in the letter, and this being the case, the action of Messrs. Charles Jarrott and Letts, Limited, as outlined in Mr. Letts' letter, appears to me to be open to criticism on the ground that it is not "playing the game."

I am, Sir,
Your obedient servant,
FREDERIC COLEMAN.

King Street, Regent Street,
April 29th, 1905.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—From the letters upon this subject which have appeared in your paper it is abundantly evident that the Society of Motor Manufacturers and Traders has entirely defeated the object for which the bond was originally brought into existence by adopting an ill-considered resolution, the effect of which is to give absolute choice of position at the Exhibition to a few favoured firms, to the obvious detriment of the majority of firms in the industry.

For years a large majority of the trade has wished to reduce the number of Automobile Exhibitions, and to secure one representative show, in the interests alike of the public, the agents, and the manufacturers. In this object the Society has been very largely successful, and the bond has been useful, and the terms of the bond justified. It is a great pity, therefore, that the Society should now seek to impose the favour-the-few-and-exclude-the-rest resolution, as this policy is producing the inevitable effect of breaking up the representative show, and reopening the question as to one or several shows.

We believe, so long as bond signers receive fair and equitable treatment, that the bond serves a useful purpose, and we have, therefore, signed the bond. We have had considerable correspondence with the Society with regard to the objectionable resolution, and the following extracts show that we have entered a very strong protest.

From our letter of March 20th, 1905:—

"We wish also, as motor manufacturers and members of the Society, to record our very strong protest against giving prior right to ballot to any persons or firms, inasmuch as it tends to establish a very dangerous precedent, and would appear to give such persons or firms the prior right to ballot for an indefinite number of years, which is obviously most unfair to the members of the Society and bondholders."

Again, in our letter of March 29th, 1905:—

"In sending in the bond and our application for space we wish to record our strongest possible protest against the regulation passed this month by the committee of management, by which the right of prior ballot for space at the Exhibition is given to a very small number of members of the Society."

It is interesting to note that we have not had any intimation that our protest has received any consideration from the committee of the Society.

Yours faithfully,
LEGROS AND KNOWLES, LIMITED,

L. A. LEGROS,
Secretary.

May 1st.



EXCESSIVE brightness in motor car lights, which is so liable to be annoying to other road users in crowded districts, has been denounced by the Roads and Traffic Reforms Association, which has passed a resolution condemning the "excessive acetylene gas and other lights carried by many motor cars. . . as such lights constitute a real public danger, temporarily blinding the sight of other road users." We have frequently dealt with this subject, and will only remind our readers that we have advocated the employment of adjustable screens for powerful lights, so that the blinding effect may be got rid of in populous districts and the full advantage of powerful illumination obtained on open country roads.

SLOWLY and surely the automobile is converting its most prejudiced opponent, the English farmer, and it is satisfactory to find that the *dépôt* of the Agricultural Organisation Society at Brandsby, in Yorkshire, which will deal directly with the farmers interested in it, and distribute their produce, intends to employ motor transport on a large scale. Mr. R. C. Yerburch, M.P., the President of the Agricultural Organisation Society, who laid the foundation stone of the new building, recognises that "the motor is going to prove the farmers' best friend, as it is destroying the disadvantages under which farmers in many districts labour owing to their isolation."

CARBURETTORS.*

(Continued from page 542.)

By Mervyn O'Gorman.

The Float.—The carburettor, if of the usual type, must have a constant level at the jet, and this constancy must be maintained whether the car is going up hill or down hill, or is tilted by the camber of the road (Fig. 14). That requires (i) an annular float with the jet in the middle (Fig. 15), or at least a float-chamber the central axis of which is very near the jet (Fig. 16).

Atmospheric Pressure.—Next we must take care that the very thin metal of the float is dome or cup shaped, or otherwise strong enough to resist the tendency to expand when the engine suction produces a slight vacuum in the float chamber, or when the barometer falls either for atmospheric reasons or when climbing mountains. If the metal of the float is sufficiently thin and flat the float will increase in volume at high engine speeds, and tend to lower the level of the petrol at the jet giving less petrol than normally. This fact might be utilised in some way, but it is an awkward law to bring into play, not only because it depends on the stiffness of the sheet metal, which may vary from float to float in manufacture, but because barometric changes will have a disturbing effect as also will air leakages into the float-chamber.

To get our carburettor without any unknown variables, must be our objective if we are ever to study the effect of modifying the known and essential variables one at a time. The float case should have small hole or air leakage, this hole allows the pressure of the atmosphere access to the liquid, and if necessary it can be provided with a tube to prevent any splashing. The float might, and can be made stiff and inextensible within the ordinary barometric range.

Petrol Density.—The question of the accurate height of the float turns our attention to petrol density on which it depends. Useable petrol varies from '722 to '680 specific gravity at 15° C., or

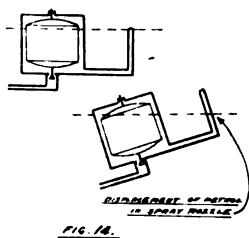


FIG. 14.

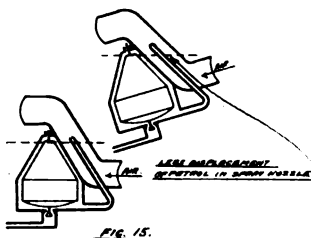


FIG. 15.

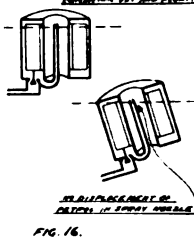


FIG. 16.

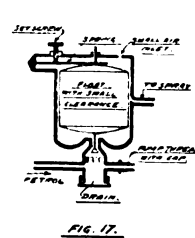


FIG. 17.

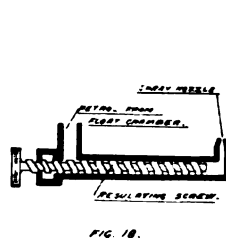


FIG. 18.

nearly 6 per cent., so that within this range the float should be capable of easy and immediate adjustment by hand. An easy way to provide this is to permanently press the float slightly down into the liquid by a light spring (Fig. 17). The milled head adjusting-screw having graduations for fuels of different densities. Having done this for our chosen petrol, we still have a variation of density with temperature. Taking the lightest petrol ('680) mentioned above, this, on a winter's day, alters in density from '70 to '66 (a new 6 per cent. variation) between the start and the time when the metal work under the bonnet becomes warm. Accordingly the float should be such as to close the petrol-feed firmly with the least dense, i.e., the warmest petrol likely to be used. This necessity militates against the pointed float, because a 6 per cent. variation of density means that there will be a 6 per cent. variation in the volume of the float submerged, which will result in the case of a pointed float in a serious variation of the height of petrol in the chamber, it might amount to 15 per cent. of the total height of the float. A possible cure for this trouble would be to design a float whose volume increases with the temperature; but an easier cure is to employ the spring above indicated, save that we must now make the spring blade of two dissimilar metals such that the pressure of the spring relieves itself when greater buoyancy is required of the float, i.e., when the float case gets warm.

Road Shocks.—We are in the habit of jolting a float to squirt petrol out of the jet on standing, and we must provide against the accidental occurrences of the same effect with road jolting. This is easily done by making the clearances exceedingly minute or introducing "baffle" plates round which the liquid could only flow with much friction, so that it can only alter its level by jolting in a time much larger than the average period of a road shock.

The Tube to the Spray.—It is clearly best not to draw the petrol from the bottom of the float-case, where fine dust and green deposit may be found accumulated in spite of all filters, but from as high up the side of it as we dare. The root of this tube also should be of large diameter so that the velocity may be very small and, therefore, not likely to disturb the quiet settling of dirt at the

bottom of the float-case (a point is made of this in the Rekto carburettor, Fig. 6). From the float-chamber to the jet the petrol has to flow at widely varying speeds (the range being about five to one for the usual ten to one engine speed range), and at widely varying temperatures. Furthermore the flow required is sometimes steady and sometimes unsteady, taking place in distinct short pulses. When the pulses are at the rate of 40 per second on a 4-cylinder car at highest speed, the flow is practically steady, so that friction in the tube and nozzle are important, but when the same car takes four draughts per second the inertia of the liquid comes prominently into play. This seems likely to complicate the law under which the liquid flows, so that we need not expect that the amount of liquid moved per stroke will bear any simple relationship to the amount of vacuum caused by that stroke. This law is even further complicated by the practical fact that either much or little liquid may be required both at the fast and at the slow speed of rotation. Here is the backbone of the difficulty of carburettor design. The laws of gases under which the air moved through the pipes cannot be expressed in a simple formula, unless the pipes be very simple and the current steady, the laws of liquids obviously cannot be expressed by the same formula because of the difference of physical state between liquids and gases, to which are superadded the complications due to fine capillary nozzles, and the irregular variations in the viscosity of the liquid in question with variations of temperature. Perhaps the best step to take under the circumstances is to devise by laboratory experiments some form of tube in which we can easily vary both the friction and the inertia, seeking for such a combination of these two as shall reduce the law of flow to any known simple law, such for instance as a "square root" proportionality between the volume of liquid discharged and the amount of pressure or "head" urging it. The head working upon the ordinary spray varies perhaps from 2 oz. to 20 oz., and of the 20 oz. it would perhaps be fair as representing the ordinary

case to consider that 16 oz. is expended after the liquid has left the tip of the nozzle, and the balance remains for overcoming the resistances in the pipes. This would account for the jet of liquid being about 3 ft. high, if it were allowed to travel upwards unshattered. What is required here are some experiments, and in this extremely adjustable carburettor which I am putting before you, I suggest having the tube long and of large bore, and introducing into it a rod which has a square thread-screw on its surface (Fig. 18). The petrol must go round and round in the path of the thread to reach the jet.

We can at will increase the length of path by pushing in the rod, and as evidently the length of the path may be too long and may be too short, there is some best position which this adjustment gives us.

It is just conceivable, but most unlikely, that the retardation so introduced might for some shape of tread, some length of path, some engine and some one position of the throttle-valve just diminish the volume of petrol at all speeds as much as the volume of incoming air was diminished, provided the temperature of air and petrol were constant. This is a position adopted by that most ingenious carburettor, the "Sthenos." We, however, must go further. We find that if the temperature of the petrol increases, its viscosity diminishes, and therefore the loss of head of the liquid by friction in the pipe diminishes also. Just as an indication of how important this change in the character of the liquid may be, I will quote you an experiment of Mr. Sorel, who found that petrol, having a normal density of '70, could be discharged at the temperatures and rates given below, when passing through the same capillary tube in the same interval of time under the same head of pressure, viz. '30 millimetres only.

5° C. ...	121.5	30° C. ...	138.5
10° C. ...	123.5	40° C. ...	150
15° C. ...	128.5	50° C. ...	163
20° C. ...	131.5		

Actually 40 per cent. more liquid passes at the very reasonable temperature of 50° C. than passes at what is by no means a very wintry temperature of 5° C.

(To be concluded.)

* Excerpt of a Paper read before the Automobile and Cycle Engineers' Institute, on Thursday, the 13th April.

THE DUST PROBLEM.*

(Continued from page 542.)

By A. Lyle Rathbone, J.P.

DURING the summer of 1904 further experiments were undertaken, the materials employed being Westrumite, applied with a water-cart, and another composition called Crystallised Creosote, Pyneoline, and Calcium Chloride. With regard to the experiment made with Westrumite, that was tried on several of the sett-paved streets, but it was found that it was impossible to put on enough of the mixture to keep down the dust without making the setts slippery; the effect on this pavement was also of a very temporary nature. The Crystallised Creosote and the Pyneoline were not satisfactory owing to the cost, which was considerably higher than that of watering.

The wood pavement in Croxteth Road was also treated with the Westrumite preparation, the first sprinkling being with the 10 per cent. solution, and a day or two later with a further 5 per cent. solution. It was found effective for only about 18 days, whereas to compare favourably with street watering it should have stood 33 days. It was also tried on macadam roads, but it was found that the cost of the mixture was against it, and in such streets as Hardman Street and Belvidere Road it would be necessary for the Westrumite to keep down the dust for a period of three weeks, but it was found to be effective for a period of only twelve days. Of all these materials, the mixture and the Calcium Chloride appeared to give the most promising results, and are worthy of further trials on a larger scale. Considering these experiments as a whole, the result would seem to point to eventual success with the use of some classes of oil in the place of water on macadam roads; as yet, however, the experiments have not been conducted on a sufficiently large scale to enable one to come to any definite conclusion, as in many cases a considerable amount of mud and dust would be brought on to, or blown on to, the treated surface from side streets or over portions of the main road which were not so treated.

Coming now to the second class; namely, those of a more or less permanent character. In this case the object aimed at is two-fold; firstly, to keep down dust, and secondly, to provide an impervious pavement, which can be laid at a reasonable price, is easy to wash, and is especially suitable in the streets of the poorer parts of the city, where the street is the only playground for children. Several experiments have been made with the following materials:—Tar asphalté paving, concrete macadam blocks, a cheap asphalté surface for macadam roads, compressed asphalté and mastic. With the tar asphalté paving, the setting properties are dependent very largely on its being exposed to the air, and it is laid in at least two layers of about $1\frac{1}{2}$ ins. to 2 ins. thick, each layer separately rolled, first with a hand-roller, and then with a light steam-roller of about 7 tons weight. A considerable interval should elapse between the spreading of the different layers. To obtain good results it is absolutely necessary to have gas tar of uniform quality, free from volatile oils, and of a specific gravity which will permit of the asphalté being stored some weeks in heaps without more than a superficial hardening. Where this can be done, it is found that the asphalté, being stiffer, a shorter time is required to consolidate it so as to be fit for traffic than when it is freshly mixed, as by the storage the more volatile oils are absorbed by the stone, and in addition a better indication is given of its probable setting properties. The composition of the tar asphalté is as follows:—In the first layer, hard limestone macadam or blast furnace slag broken to pass through a $1\frac{1}{2}$ -in. ring, and thoroughly coated with hot gas tar. Second layer, hard limestone or slag broken to pass through $\frac{3}{4}$ -in. ring, and similarly mixed with hot gas tar. In some cases the surface is finished by mixing $\frac{1}{4}$ -in. limestone with a $\frac{1}{2}$ -in. stone, if a fine surface is required, otherwise the $\frac{3}{4}$ -inch stones are brought right to the top. In my opinion the rougher surface had a distinct advantage over the finer, as being less slippery in wet weather. Much difficulty was experienced in getting a uniform mixture, and the best sample was probably the section laid in Prince's Avenue, which has been down for about five years, and shows very little signs of wear.

The minimum thickness is 3 ins. where the foundation consists of old boulder pavement, 4 ins. when laid on existing surfaces of ordinary macadam pavement, and $4\frac{1}{2}$ inches if laid on new hand-pitched foundation. I should be inclined to think that in this last case a depth of 6 ins. laid in at least three layers would be preferable. The average cost works out to be between 10d. and 1s. per superficial yard per inch of depth.

The concrete macadam blocks are made in moulds. The method of manufacture consists in packing large-sized macadam stones, spaced as nearly as possible $\frac{3}{4}$ in. apart, in the moulds; the interstices are then filled in with a concrete composed of two parts of

finely-crushed granite to one of cement, the top of the mould, which really forms the bottom of the block, being filled with destructor clinker concrete mixed in the ratio of four to one. The surface on which the blocks are moulded is faced with brown paper, in order to leave the working surface of the stones free from cement as much as possible, so as to obtain a non-slippery roadway. The blocks are laid on a bedding of concrete in courses across the street, breaking bond as in brickwork; the joints being run in with Portland cement grout, and the street can be opened for traffic in a few days. The cost of the blocks laid complete on concrete amounted to 5s. 6d. per superficial yard, and I anticipate that this will be considerably reduced in the future—as the result of greater experience. The experimental areas have been laid in several of our streets, the largest of which was in Dorothy Street. It has also been tried successfully on ordinary street crossings. A further experiment will be tried on the line of docks, in order to test this form of paving very severely, with the object of quickly arriving at the probable life of these blocks, so that a fair idea can be got of the lasting qualities under ordinary traffic.

A cheap asphalté surface has been tried on macadam roads, by coating them during dry weather with hot tar stiffened with pitch, covering off with clean dry chippings.

This has been found to last about nine months in good order, and costs about 4s. to 5d. per superficial yard.

The material used for the compressed asphalté pavement consists either of a natural asphalté rock, crushed finely and enriched with a portion of bitumen, as in the case of those pavements laid down by the French Asphalté Company, or it is a composition formed by the admixture of sand and powdered limestone, with a natural bituminous matrix, as is the practice of the Asphalté Company. The cost of this preparation amounts to 8s. 6d. per superficial yard, the Asphalté Company undertaking the maintenance for 10 years. The French Asphalté Company bring the material on the ground in the form of a dry-looking powder at high temperature. This is spread evenly on the prepared foundation, usually concrete, and rammed by means of flat beaters until it reaches the required thickness, which for carriage-ways is about 2 inches.

The Trinidad Asphalté Company, on the other hand, have laid their paving in Liverpool in two layers, the first of which consists of hard sandstone well coated with an asphalted composition, which has a depth, after being hand rolled, of about $1\frac{1}{2}$ ins. The top course, about 1 in. thick, is composed of an asphaltic composition of sand, limestone, and bitumen, as above described, spread finely over the first course, and then steam rolled with a quick moving steam roller of about 5 tons weight. Both of these systems have given equally good results, but the Trinidad asphalté has been used in Liverpool chiefly as a covering for old boulder paving, more especially in the poorer parts of the city.

The Mastic asphalté, which is supplied by the Trinidad Asphalté Company and other firms, is laid in a molten state, heating the composition in boilers on the ground, and spreading it evenly on a prepared foundation. It is ready for traffic as soon as it is quite cold. It compresses to some extent by the action of the traffic over it. The compositions which I have dealt with under this second head appear to me to be more suitable, with the possible exception of the tar asphalté paving, for town work, as their comparatively high cost would make them beyond the means of most country districts; and I think we must probably look, at any rate for the present, outside large towns to either the tar asphalté or to some method of treating ordinary macadam roads with oil or a mixture of oil and tar.



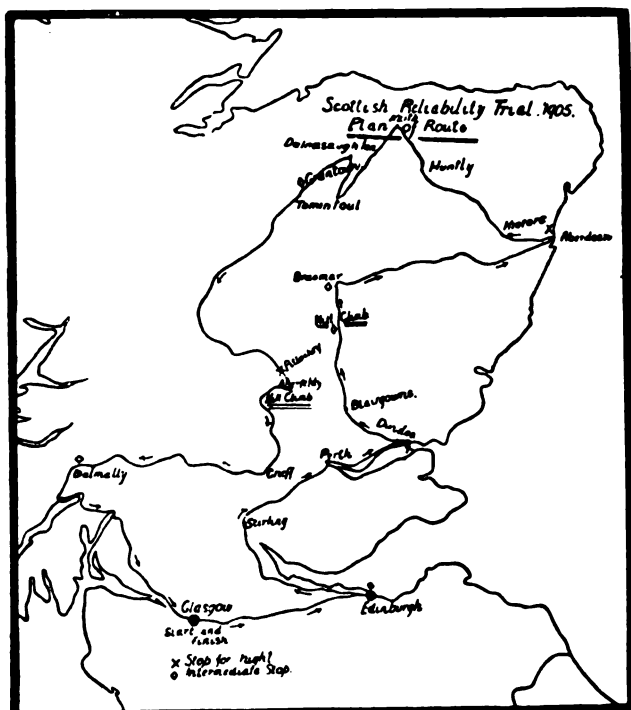
DR. ORMANDY is shortly to be entertained at a banquet by the Society of Motor Manufacturers and Traders in recognition of the great assistance which he has given in connection with the alcohol question. Dr. Ormandy will then read a paper upon the subject.

WE have recently had an opportunity of witnessing the behaviour of "Samson-sur-Michelin" non-skid tyres fitted to a Mercedes car under very drastic conditions on extremely trying and slippery roads in Devonshire and particularly on Dartmoor. The effectiveness of the bands was all that could be desired, for they prevented the slightest tendency to skid even on the most greasy and treacherous hills, whilst as an example of the excellence of the tyres themselves, it may be mentioned that a distance of over 800 miles had already been run on them without once using the pump.

* Excerpt of a Paper read before the Liverpool Self-Propelled Traffic Association, April 13th, 1905.

RACES, RECORDS, AND TRIALS.

Scottish Reliability Trial.—The alteration in the route to Grantown-on-Spey for the third day, which we announced recently, will make the distance for that journey 109½ miles instead of 77½, as stated in the preliminary programme. This alteration has been found necessary by the committee owing to the fact that after an inspection of the roads on the original route the severity of the late winter has rendered several portions of the route impassable, and otherwise absolutely unsuitable to a successful trial. The special hill-climbing tests will now be confined to the hills of Spittal, of Glenshee, and at Aberfeldy.



Outline Map of the Itinerary of the Scottish Reliability Trial.

We have received an advance proof of the programme of the Trial taking place on 10th, 11th, 12th, and 13th of this month. It is a bulky document of over fifty pages, and comprises the rules and conditions, list of entries, instructions to observers, tables of distances and time allowances, and very full notes on the itinerary, together with maps, plans of the hill-climbs, and other interesting matter. The outline map of the route of the Trials we reproduce. To automobilists touring in Scotland, and using in whole or part the Scottish Reliability Trial route, this programme would be invaluable, and we are authorised to state that it may be had on application to the hon. secretary of the Scottish Automobile Club (Western Section), 59, St. Vincent Street, Glasgow, in exchange for fourteen stamps.

The proposed hill-climbing competition on the Eastdene Road, which runs from Old Eastbourne up the slopes of the Downs, has been duly authorised by the local authorities.

Tourist Trophy Race.—Captain Theo Masui, with a Germain car, has now brought the number of competitors up to fifty-two. As it will be necessary to limit the number of competitors, any owners who are wavering in regard to taking part should lose no time in putting forward their entry, as irrespective of the daily advance in the amount of the entrance fee, all entries beyond a certain number will have to be refused.

Fuel Consumption Trial.—On Saturday last, the Hertfordshire A.C. held a 50 miles consumption trial. In consequence of the nearness of the Easter holidays, the entry list was not a full one, only four starters turning out, but the trial was nevertheless interesting and instructive. In the end, the winner was found in Mr. C. Edge, who drove a 15-h.p. Napier, weighing with passengers, over 28 cwt. His total fuel consumption for the distance was very little over 1½ gallons. The route followed was from the Red Lion Hotel, Hatfield, to Biggleswade and back, the minimum time allowed being 2½ hours, and the maximum 3½ hours.

Among the members and others who attended were: Mr. S. F. Edge and Earl Russell (30-h.p. Napier), Mr. and Mrs. E. T. Pryor (14-h.p. Crypto), Messrs. Stocks and Swindley (15-h.p. De Dion), Mr. and Mrs. Hudden (8-h.p. Crypto), and Mr. and Mrs. F. Hodson (4-h.p. Humber). Appended are the results of the trial:—

Car.	Driver.	Weight.	Total	Cons. per ton mile.
		ton.	gals.	gals.
15-h.p. Napier	Mr. C. Edge	1.4375	1.6125	.00243
15-h.p. Darracq	J. Rogers	1.2875	2.25	.035
6½-h.p. Humber	Mr. E. Neal	0.775	1.3125	.0362
8-h.p. De Dion	Mr. J. Burnet-Geake	0.9375	1.95	.0416

Mr. D. Corse-Glen officiated as judge, and the arrangements generally were in charge of the hon. secretary, Mr. W. Whittall.

The Bianchi and Lisle Cases.—We have received from the A.C.G.B.I. the following official notification in regard to the two driving cases:—

In the case of Mr. J. Lisle, the decision of the committee of the Automobile Club of Great Britain and Ireland was that "Mr. Lisle be not admitted to the Competitors' Register subject to the matter being reconsidered when the case before the Quarter Sessions has been determined, should Mr. Lisle apply for its reconsideration." The effect of this decision is to debar Mr. Lisle from taking part in any competition in the Isle of Man or elsewhere until his appeal has been heard at Quarter Sessions.

In the case of Mr. Bianchi, the decision was that "the committee, considering that this is the first case which has occurred under the Regulation of the 4th July, and that there has been no previous complaint against Mr. Bianchi, resolved that he be severely reprimanded, and suspended for one month."

M. Paul Meyan's Challenge.—In regard to this sporting offer, we have received, under date May 2nd, the following communication from Mr. S. F. Edge:—

"I notice that M. Paul Meyan's challenge, on behalf of the French motor car, to run against a motor car entirely constructed in England, has not yet been accepted to the satisfaction of M. Paul Meyan.

"In view of the fact that a British automobile holds the world's record for reliability, I am prepared to meet M. Paul Meyan with a Napier motor car on his own terms as originally set out, including the advantage to him of running the trial entirely over French roads.

"I would like, at the same time, to express my appreciation of the very sporting challenge that he has put forth, and, win or lose, it will be a very great pleasure to have participated in such an event."

At the moment of going to press we learn that Mr. Siddeley, anxious to fall in, if possible, with Mons. Meyan's challenge, wrote to Mons. Meyan, urging reconsideration of the acceptance, at the same time stating that he would be prepared to run 3,000 kiloms. in France and 2,000 in England. This point again, however, Mons. Meyan could not concede, and, moreover, notified Mr. Siddeley that the A.C. de France, whom he had approached, had declined to recognise the suggested match officially. Mr. Siddeley then at once replied, deciding, under the circumstances, to accept Mons. Meyan's original challenge in its entirety, the daily distance to be 320 kiloms., at the same time stating that he hoped the whole trial might be carried out under the supervision of the A.C.G.B.I.

GORDON-BENNETT CUP RACE.

GENERALLY speaking, all those who are in the vicinity of the Auvergne Circuit not only do not object to the racers and other cars traversing the course, but in the majority of cases the drivers are encouraged to do their utmost. Some cases, however, of very inconsiderate behaviour have brought about a certain amount of prejudice against the drivers as a body, and in some districts a regular campaign is being made to suppress the racing. De la Touloubre was last week nearly the victim of one of the objectors who took drastic steps to enforce his objection to the racing cars, by building up a wall of paving stones across the road round the bad corner leading out of Pontgibaud. Such hints as these will no doubt bring about more cautious driving, but it is hardly a commendable way of enforcing the rights of the public, even if it relieves the authorities of the necessity of taking action in the matter.

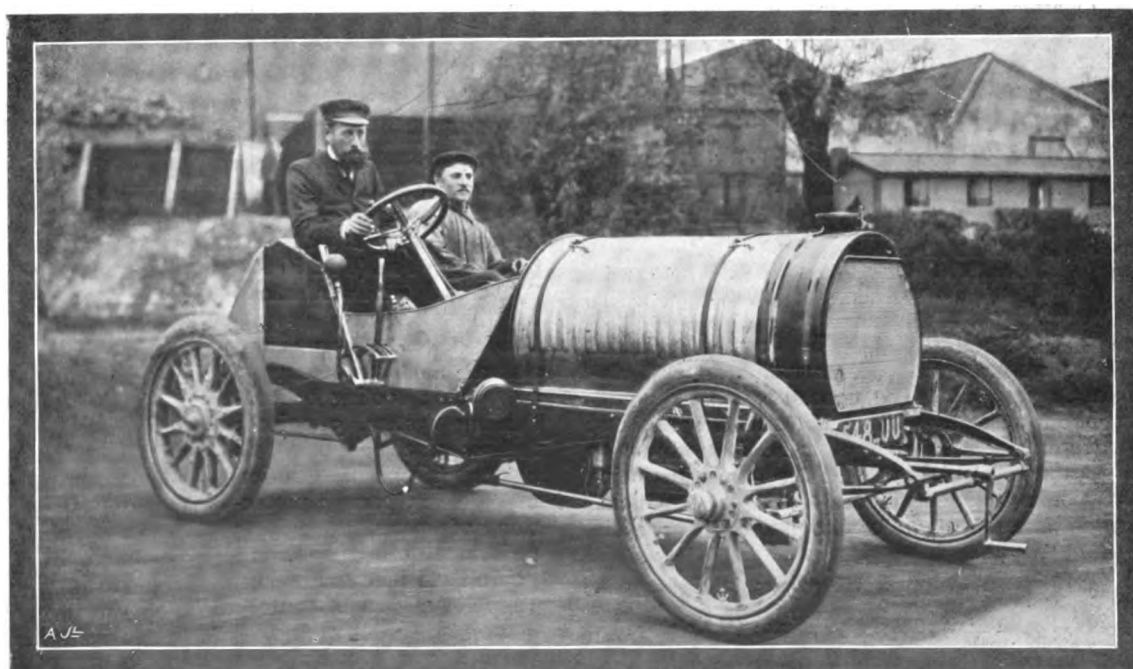
The exact distance over the Circuit has now been officially certified as 137,444 kiloms. This will be covered four times, making a total of 549,776 kiloms. The only neutralisation which it is thought should be

enforced will be near Volvic at the level crossing at the commencement of the most winding portion of the whole circuit, there being at any point not more than 100 metres in the straight. This extends as far as the outskirts of Clermont Ferrand, a distance of 15 kiloms. It is suggested that cars from Volvic should follow each other at four minutes intervals.

A remarkable coincidence has been pointed out in connection with the distinguishing numbers carried since the institution of the race in 1900. The official numbers allotted to the winning cars for each of the years commencing with 1900 up to last year, were as follows: 1900, Charron, No. 1; 1901, Girardot, No. 2; 1902, Edge, No. 3; 1903, Jenatzy, No. 4; and 1904, Théry, No. 5. The car securing No. 6 this year should indeed be a favourite with the superstitious, on the chance of this extraordinary coincidence continuing.

Last week we published the probable drivers of both the German and the Austrian Mercedes vehicles, which differed from any combination of names previously issued. These names as exclusively given by us last week have now been officially confirmed as the drivers on behalf of those two countries.

The agreement come to by the club representatives at the meeting of the International Commissioners for the Cup in Paris, that the expenses of the race should be borne proportionately by the various competing countries' clubs, is now resulting in trouble in one direction. The Swiss Club, it is stated, have suggested that this extra expense should be borne by the competitors entering on behalf of Switzerland. MM. Dufaux, who are the sole entrants for Switzerland, take a different view, maintaining that they paid their proper entrance fee long before this decision had been come to and that they did not authorise such liability to be undertaken on their behalf. They consider that this is a liability which should rightly fall on the Swiss Club, and not on the individual maker. MM. Dufaux are not inclined to add



GORDON BENNETT CUP.—One of the 1905 Hotchkiss Racers which will take part in the French Eliminating Trials. Le Blon, who will drive this car, is at the wheel.

this expense to the already heavy cost of producing the cars, and at the present moment therefore there is considerable prospect of Switzerland being unrepresented in the race by the withdrawal of Messrs. Dufaux.

In addition to the two Pope-Toledo cars, one of which is to be driven by Mr. H. H. Lyttle, the Locomobile Company have built a 90-h.p. petrol car for Dr. H. E. Thomas, of Chicago, expressly for competing in the Gordon-Bennett Race. This latter machine is to be driven by Joseph Tracy, and is of much the usual chain-driven type, with a 9 ft. 1 in. wheel base, a 4 ft. 6 in. track, and 34-in. tyres. The engine, which has four cylinders, cast in pairs, has a low-tension magneto ignition system, and is nominally of 90-h.p., but is expected to develop considerably over 100-h.p. Peculiar features are that the Truffault-Hartford "anti-shock" device is employed to restrain all four springs, and that the exhaust-gases are to be allowed to escape direct to the atmosphere.

The three "Hotchkiss" Gordon-Bennett cars are somewhat shorter and narrower than those of last year. The pressed-steel frame is stayed on the underside, and is curved up at the rear. The driving tyres are 980 x 120 mm., and those on the front wheels are 880 mm. in diameter. The castings forming each pair of cylinders are fixed slightly out of line with the axis of the crank-shaft, and the engine develops about 120-h.p. at 1,100 revs. per min.; the bore and stroke are 185 mm. (7 $\frac{3}{8}$ ins.) and 160 mm. (6 $\frac{1}{8}$ ins. approx.) respectively. Low-tension magneto ignition is employed, the clutch is of the cone type—specially arranged to prevent the leather face from slipping—and the gear-box, which is employed in conjunction with a propeller-shaft drive to the live-axle, is of the Mercedes type, giving four speeds and a "reverse." Following the usual Hotchkiss practice, the crank-shaft is mounted in five ball-bearings.

THE Isle of Man Eliminating Trials taking place on the 30th will start at 9 a.m. from the railway crossing close to Quarter Bridge, a mile west of Douglas. The order of starting is as follows:—

Car.	Entered by.	Driver.
1. Star ...	Sir A. Hickman, M.P.	—
2. Star ...	Mr. E. Lisle ...	Mr. F. R. Goodwin.
3. Darracq ...	Mr. A. Lee Guinness	Mr. A. Lee Guinness.
4. Wolseley ...	Mr. H. Austin ...	Mr. C. Bianchi.
6. Napier ...	Mr. S. F. Edge ...	Mr. Cecil Edge.
7. Napier ...	Mr. S. F. Edge ...	Mr. W. Clifford Earp.
9. Napier ...	Mr. John Hargreaves	Mr. John Hargreaves.
10. Siddeley ...	Mr. L. de Rothschild	Mr. Sidney Girling.
11. Wolseley ...	Mr. H. Austin ...	—
12. Napier ...	Mr. S. F. Edge ...	Mr. A. E. Macdonald.

Nos. 5 and 8 have not been apportioned.

Touraine Tourist Trial.—The contest organised by the Touraine A.C., amongst its members, was concluded on Sunday last. The contest was a reliability run over 600 kilometres, a hill-climb, and a speed test over 500 metres. For each of these, in addition to general appearance, points were allotted, the cars being classed according to price of chassis, points also being apportioned in each class for the latter. The results were:—

Cat. 2.—(1) Boyer II., 14-h.p., 698 points; (2) Delahaye I., 8-h.p., 655 points.

Cat. 3.—(1) Regina-Dixi, 16-h.p., 658 points; (2) Delahaye II., 16-h.p., 657 points.

Cat. 4.—(1) Aries III., 30-h.p., 810 points; (2) Brouhot II., 20-h.p., 790 points.

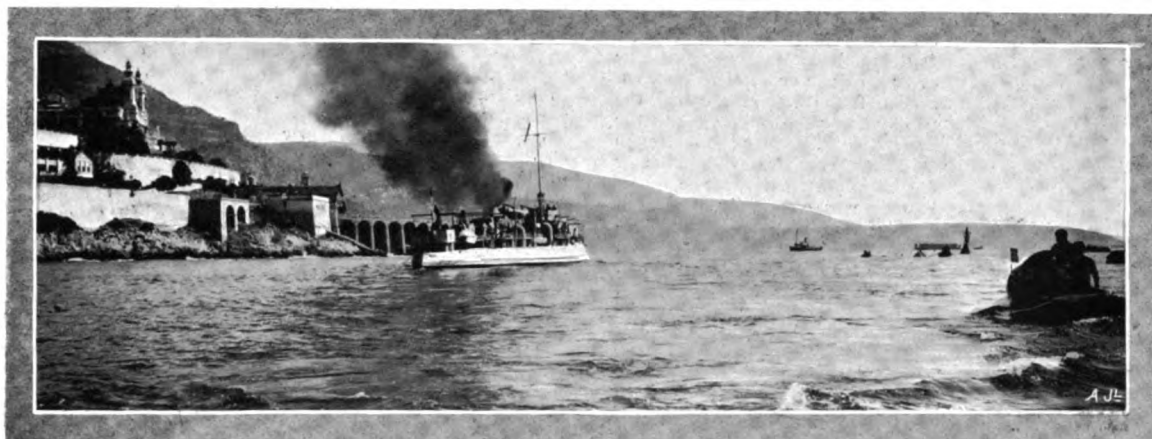
Cat. 5.—(1) Brouhot IV., 40-h.p., 800 points.

Military Motor Wagon Trials.—It will be remembered that last November trials for military motor wagons were organised by the French Minister of War, but on the morning when the competitors should have started it was announced officially that it was considered by the military authorities that none of the vehicles presented complied sufficiently with the conditions laid down to justify the trials being proceeded with. Since then fresh regulations have been issued for the postponed trials, which are to take place during the early part of August next. Although these trials, which will be held at the same time as the Industrial Vehicle Trials, will only be open to French manufacturers, the requirements of the French military authorities should prove of interest on this side of the Channel. The vehicles will be tested over 330 kiloms., divided over five days, about 75 kiloms. per day (except the first day) having to be run off over different routes each day. Either internal-combustion or steam vehicles may be entered. Those with explosion motors should be capable of using petrol, pure or carburetted alcohol, or heavy oil, at any time, according to what may be procurable, although this is not obligatory. The total weight for each wagon, fully laden, must not be greater than 3,200 kilogs., of which at least 1,000 kilogs., and not more than 1,200 kilogs., must constitute the useful load. Electric ignition must be employed, and preferably magneto ignition. Speeds ranging from 3 $\frac{1}{2}$ and 4 $\frac{1}{2}$ kiloms. per hour to a maximum of 16 to 20 kiloms. per hour is compulsory. The steering apparatus must be placed to the right, and each vehicle must be capable of travelling not less than 75 kiloms. per hour without having to replenish fuel, &c. The chassis must be constructed either of pressed steel, steel tubes, armoured wood, or sheet steel. No part of the chassis, chains and brakes excepted, must come within 18 cms. (7 $\frac{1}{4}$ ins.) of the ground. The track must not be more than 2 m. (6 ft. 6 ins.), nor the wheel base less than 2 m. All vehicles must be fitted with a body on the lines of those in military use, of which a sample will be available for inspection by the intending competitors. The cubic capacity must be 3 m. (35 cu. ft.), at least, the height of the body from the ground must not exceed 3 m. (9'8 ft.), and the total width must not exceed 2 m. (6 ft. 6 ins.). The judges will award marks in the following proportions:—Power, simplicity, and accessibility of engine, 13 points; cooling or condensing system, 5 points; fuel and oil consumption, 15 points; friction and action of parts, 15 points; protection of parts, 2 points; resistance of wheels, 15 points; efficiency of brakes, 10 points; ease of control, 5 points; hill-climbing, 8 points; ratio of useful load to total weight, 7 points; mean speed, 5 points.



The Medal which Macdonald secured at Florida Beach Race.

MOTOR BOATING.



MONACO MOTOR BOAT MEETING.—The French torpedo boat destroyer, L'Arbalète, steaming out of port to convoy the competitors in the Cruiser Class.

Cross-Channel Race.—Last week we exclusively announced that not only would the Cross-Channel Motor Boat Race terminate at Folkestone instead of at Dover, as had been previously decided, but we also stated that the start would be from Boulogne instead of Calais. This has now been officially confirmed. No doubt this change has been mainly brought about from the fact that the Boulogne authorities have offered a subsidy of 25,000 francs to the race. It has not yet been decided whether the race will be simply to Folkestone, or to Folkestone and back again to Boulogne, allowing one day's interval at Folkestone.

Suresnes Motor Boat Races.—Under the auspices of the Hélice Club of France, some interesting events have just been held for motor boats on the Suresnes Basin. The course was over a distance of 18 kiloms., and the results were as follows:—

1st Series: boats up to 6½ metres.—1. Mustapha (6-h.p. Aster motor). Time, 1 hr. 35 mins. 2 secs.

Series 2: up to 8 metres.—Dalifol (12-h.p. Abeille), 1 hr. 19 mins. 54 secs.

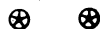
Series 3: selling race for all types of boat.—1. Mab (75-h.p. Richard-Brasier motor), 41 mins. 8½ secs. 2.

Ninie (12-h.p. Auge), 1 hr. 11 mins. 21 secs. 3. La Folie (Abeille motor), 1 hr. 11 mins. 38 secs.

The performance of Mab is interesting, as this is British-owned, being the property of Mr. Thubron, and is down for taking part in the Algiers-Toulon race. Mab is fitted with the Richard-Brasier motor which last year was in Tréfle-à-Quatre, whilst the hull is the old Titan I.

OWING to the lack of arrangements for rendering aid to competitors in distress during the recent Monaco Motor Boat Meeting, the members of the organising commission have decided to make special arrangements for next year, whereby there will be small probability of a recurrence of such scenes as were unhappily witnessed this year.

LIEUT. MANSFIELD CUMMING, R.N., whose investigations on the employment of internal combustion engines as auxiliary power for fishing boats, have been dealt with at some length in a previous number of the Journal, has recently purchased the hull of "Napier Minor," presumably with a view to utilising it for the further prosecution of his experiments.



A New Police Move.—Finding their occupation on the down-grade gone, the police in several districts have recently been placing their traps on up-grades, a point worth remembering, especially when on the Brighton Road.

A Motor Lochinvar.—Much sentimental interest and a little amusement has been evoked by the recent West-End marriage in which an independent heiress bestowed her heart, her hand, and her fortune upon the good-looking motor car driver, whom her father had originally engaged to initiate her into the mysteries of automobile management, and whom he subsequently employed as a driver. There are those who are suggesting that here we have a final and complete answer to the eternal problem of "what shall we do with our boys?"

Make them motor car drivers, it is argued, and ultimately they will marry heiresses. No doubt one can be too conventional about things of the kind, and there are many thoroughly cultivated young men who are embracing the driving of motor cars as a profession, but all the same one can understand that if such alliances become at all general, *paterfamilias* will become very chary of engaging young and good-looking chauffeurs. It is always possible to obtain the services of an elderly coachman, but the motor car industry is too young to provide a supply of elderly chauffeurs, though doubtless we shall have them in time, and possibly in some circles there will then be a demand for them. Previously, however, we may anticipate an opening for lady chauffeurs, who will doubtless be in favour with the heads of families where there are wealthy marriageable daughters.

CLUBS AND ASSOCIATIONS.

Reading A.C.—At the invitation of the president, Mr. G. Loftus Brigham, the opening run on Good Friday consummated in an excellent luncheon at the Castle and Ball Hotel at Marlborough. The event was a complete success.



Reading Automobile Club.—
The President.

chiefly due to the personal interest the president has taken in the affairs of the club.

THE BRITISH EMPIRE MOTOR TRADES ALLIANCE inform us that they are compiling a Register of British Manufacturers of Automobiles, Motor Engines, Component Parts, and Accessories. With the object of encouraging the home industry it is intended to supply information to inquirers, private or trade, as to where any automobile or requisite manufactured in the United Kingdom may be obtained. British manufacturers are requested to send to the secretary at 11, Red Lion Square, London, the fullest details of their manufactures, and to specify that they are manufactured in the United Kingdom.

British Motor Boat Club.—Quite a formal little parade will be made by the motor launches in their trip to-day (Saturday), starting from Kingston-on-Thames, when the opening meet of the club takes place, as already announced. Commodore Sir William Kennedy, K.C.B., is to lead the way on his launch as far as Teddington, and then back towards Hampton Court. A formal "salute" will be accorded to the Commodore's launch by the rest of the fleet prior to the return up river to the Sun Hotel at Kingston, where the inaugural dinner will be served at 6 o'clock.

Particular attention is drawn to the sailing matches which are being held in Kingston and Surbiton Reaches, with the object of avoiding the smallest interference with the competing sailing boats.

About 90 members and guests have promised to attend the meet and dinner, amongst these being the Marquis of Ailsa, Admiral Sir William Kennedy, K.C.B., commodore of the club, Captain Bacon, R.N., Sir Henry Seton-Karr, and Mr. C. G. Kennedy, the Metropolitan magistrate.

The Ladies' Automobile Club.—The following ladies have lately been elected:—Mrs. E. Amsden, Mrs. Wm. Chaver, the Dowager Countess of Dudley, Lady Juliet Duff, Miss Jefferson, Mrs. Loeffler, Miss M. E. Morris, Miss Scott. Members of the club will join the Grosvenor Club in their facilities for seeing both the Ascot and Henley events this year.

Leicester A.C.—The club run last week was to Market Harborough. Sixteen cars made the journey in unfavourable weather. By the invitation of Mr. and Mrs. E. Kennard, an inspection was made of The Barn, the residence of that lady and gentleman, and much interest was taken in the fine collection of curios possessed by them. Subsequently the whole party, including Mr. and Mrs. Kennard, adjourned for tea, to the Angel Hotel.

The return journey commenced at 6.30 from The Barn. The last two cars met with a little adventure as they ran out on to the road from the drive. A party of gipsies were camped on the roadside, and one of them, holding a child in his arms, excitedly signalled the automobilists to stop. The latter, who at once jumped to the dismaying conclusion that a previous car had run over the youngster, pulled up, and inquired if there had been an accident. To their relief the gipsies answered in the negative, but said the child had been taken suddenly and dangerously ill, and they wished to get it to a doctor as soon as possible. They were invited to come aboard, and were taken down to the medico's residence in very quick time, the motorists receiving their voluble thanks when the destination was reached.

Scottish Automobile Club (Western Section).—In spite of exceptionally bad weather, the opening run on Saturday to Callander was well attended. About 20 cars and between 60 and 70 members and their friends arrived at the Dreadnought Hotel during the afternoon.

South African A.C.—At the annual banquet of the club, held in Cape Town recently, at which Mr. A. T. Hennessy, the chairman of the club, presided, an account was given of the successful progress of the club during the previous year. A number of excellent speeches were made and Mr. Rudyard Kipling was amongst those who spoke, he responding to the toast of "The A.C.G.B.I. and Motoring in General." His speech was in his usual trenchant and humorous style, and during his response to the toast he said that when he listened to the calm and confident optimism of their speeches that night his heart had been heavy within him. The worst of it was that their optimism was entirely justified. The world had at last realised the gospel that they had preached in the highways for the last ten years, namely, that transportation was civilisation, and was hastening to put their doctrine into effect. At the present moment the inhabitants of that most conservative stronghold, the Strand (he did not mean Somerset Strand, but the Strand where Somerset House was) were considering just how quickly they could drop and abandon their hired hairy enemy, the horse, and climb into a motor omnibus or cab. London cabmen were now taking lessons in driving motors, but he hoped that he would not be one of their first passengers. The Department of Agriculture at home had been approached to allow the manufacture of a peculiarly atrocious form of potato spirit, which would supplant their precious and well-beloved petrol. Through the length and breadth of England arrangements were being made for the delivery of provisions by motor cars, motor buses, and motor luries, and even here he understood recently the driver of a motor car had run into a local market cart with most striking results. Yes, gentlemen, the world was with them—almost too much with them. It seemed only yesterday that they were semi-officially described as children of Belial, urging juggernaut cars over the prostrate forms of a paralysed population. To-day they were no longer a stench in the nostrils of their fellow-men, to-day they moved in the odour of sanctity. A generation as quick to praise as it was to blame ascribed to them all the merits of patent medicine or patent pavements, for they had passed beyond the stage of experiment and were accepted without debate. Their very cars, thanks to the extended mechanical knowledge on the part of maker and purchaser—he spoke with a sad heart—were scarcely more difficult to manipulate than a case of razors. When they went out they proceeded, when they came back they returned. They could go out six days a week, and he was credibly informed that there were people who did it on Sundays. The legend of the broken-down car being taken home by the broken-down horse would very rapidly take its place with the legend of the mother-in-law and the legend of the lodging-house cat. Let them be warned in time. They were being borne on the greasy flood of success towards unromantic and certain goals; they enjoyed a good reputation. In a very little time they would be discarded and laid aside as a civilising agent, a moral force, one of the dynamic factors of the great march of progress. All men would speak well of them, and the waters of success would close over their heads, and with them the darker waters of respectability, until the airship came into existence, and they would find their president leading the aeroplane club of Capetown in circles, like a lot of blessed doves, around the roof of the Standard Bank of South Africa. He wished he could adopt a tone that was more optimistic, but, frankly, he could see no break in the gloom of unqualified and reiterated success that threatened to envelop them. They might urge that, although they had the finest climate and views in the world, yet they had not many miles of roads whereon to run their cars in this sub-continent, but that was a detail. When one looked

back over the vista of the last ten years, one realised that the pillars of the temple of felicity were before them—they would be respectable, and he could only mourn.

Amongst others who supported the chairman were the Hon. Victor Sampson (Attorney-General), the Hon. Sir Lewis Michell (Acting Secretary for Agriculture), and Mr. A. C. Fuller (Honorary Secretary of the Club), the Hon. Colonel Crewe (Colonial Secretary), Sir David Gill (Astronomer Royal), Mr. Maitland H. Park, Dr. M. Hewat, Mr. D. P. de Villiers Graaff (Vice-Chair), Mr. J. Garlick, M.L.A., Sir W. Thorne, M.L.A., the Hon. E. Powell, M.L.C., Major Crawford, Hon. J. A. C. Graaff, M.L.C., Mr. J. T. Wyld, R.M., Dr. Arderne Wilson, Advocate Upton, Dr. Cassalis, Mr. H. M. Arderne, Mr. J. M. P. Muirhead, Mr. A. Ohlsson (Consul-General for Norway and Sweden), Messrs. Blackman, C. Garlick, M. Irving, Donald Menzies, A. P. L. Wahl, S. Benjamin, J. R. G. De Klerck, J. Rose, Edgar Bissett, Klein, and W. B. Gordon.

Yorkshire Automobile Club's Opening Run.—" 'Twas a nippin' and an eager air " when the Yorkshire motorists set off upon their journey to Windermere on Saturday last. It was also raining with a suicidal vengeance, and the roads were thick with grease and dangerously heavy. Such conditions might well have damped the enthusiasm of motorists, but to enjoy the lavish hospitality of Mr. H. R. Kirk, at whose invitation the club was gathered together, was something that they could not withstand.

It says much for the popularity of Mr. Kirk that between 80 and 90 members and friends, including several ladies, turned out and braved a journey beset by every difficulty imaginable, and it speaks well for the handling of the cars when it can be said that no accident occurred.

The first to arrive was Mr. Arthur Kirk on his Renault, and then the genial hon. secretary, Mr. Percy Wilson, came in, both with a mournful account of the glorious roads.

Dinner was served at the Crown Hotel at 7.30, and by this time all the cars had come in. After dinner Mr. Charles Jarrott, who had only recently come from Paris, and had driven his 28-h.p. Crossley car from London, in proposing the toast of "The Press," spoke of the attitude of the public towards the motorist, and the part played by the Press. He appealed to them to adopt a calm and judicial attitude towards accidents, and endeavour to lessen the painful amount of hysteria that is rampant at the present time.

The Sunday morning outlook was promising indeed, and after breakfast Mr. Kirk embarked his guests in steam launches, and they departed for Waterhead, Ambleside.

Mr. Kirk's boat, "The Pearl," is by Sissons, of Gloucester, and is fitted with a triple expansion engine of 11.8-h.p., working at a

steam pressure of 225 lbs.; she is capable of a speed of about 24 miles an hour. Mr. Kirk also possesses a motor boat, "La Blanchaille," which is at present dismantled, owing to the weight of the 22-h.p. Crossley engine being too heavy for the hull, and so a smaller engine is being put into her. The "La Blanchaille," we believe, was the first petrol motor boat on Lake Windermere. It has a speed of about 17 miles an hour.

After the return to Bowness, luncheon was served, and in the afternoon the motorists had the pleasure of another trip, this time in the rain, by way of variety, to the Ferry Hotel, at the other side of the lake, where tea was served.

About five o'clock the exodus commenced, and by seven many of the cars were well on their way to Leeds, Bradford, Harrogate, Dewsbury, and other towns of Yorkshire.



Charles Jarrott prepared for any weather.

THE formation of a motor club for Norwood and the district, under the title of the Norwood Motor Club, is on the tapis. We understand a number of automobilists have already arranged to join, and a strong club in the district of Norwood should prove of

considerable value, not only to those in the immediate neighbourhood but to the cause generally. At present, Mr. Douglas S. Cox, of Thomas Place, West Norwood, is doing yeoman service in forming a nucleus for the association. Any who can assist him in the organisation of this club should write to him at that address, as a formal inauguration, it is hoped, may be arranged for the 20th instant with Brighton as the probable venue.

MOTOR CYCLING.

Auto-Cycle Club Hill-Climb.—To-day (Saturday) the hill-climb of the club takes place in Mr. F. S. Phillipson Stowe's fine grounds at Blackdown House, Fernhurst, near Haslemere. The machines are divided into 6 classes, for which 39 entries have been received. Mr. Stowe's park is about 4½ miles from Haslemere Station.

Hill-climb at Bangor.—On Saturday last the Northern Section of the Motor Cycle Union of Ireland decided the second hill-climb of the present season. The venue was at Central Avenue, Bangor—one of the prettiest seaside resorts on the northern coast and some twelve miles from Belfast. The evening was remarkably fine, and a large concourse of spectators witnessed the contest, which was of an exciting description. The handicap was framed on the basis of the rider's weight and the horse-power of the engine. Owing to the recent heavy rain the surface was not all that could be desired, and at places was of a holding nature and at times on the slippery side. Ten competitors took part in the event and eight succeeded in getting to the top, while two were disqualified for pedalling. Result:—

	secs.
1. R. Ireton (Royal Riley)	32½
2. J. B. Ferguson (Minerva)	35½
3. S. P. Corry (Cottreau)	38½
4. J. Harden (Royal Riley)	39½
5. P. S. Brady (Centaur)	42
6. J. S. Garrett (Hobart)	43½
7. J. Stewart (Centaur)	52½
8. B. Robb (Bat)	55½

Irish Motor Cycle Union Speed Trials at Portmarnock.—The headquarter staff of the Motor Cycle Union of Ireland opened the active season at Portmarnock on Saturday last, when a series of time trials, over a mile course from a standing start, and a pace-judging competition took place. The weather was favourable, but the attendance fell short, owing, no doubt, to the threatening nature of the forenoon. C. B. Franklin was successful in both events in which he competed, and covered the mile in 1 min. 25 secs., the fastest that gentleman had previously accomplished at Portmarnock. The pace-judging competition was well supported, fifteen competitors taking part therein, including three cars. The conditions were as follows:—Each competitor to ride or drive a distance of 440 yards over a straight course from a flying start, at a pace equal to 20 miles an hour, and returning to the starting point to again cover the course at a pace equal to 7½ miles per hour, the standard time allowed for the first, 45 secs.; for the second, 2 mins.; competitors doing over or under the standard to lose five marks for each fifth of a second. The successful individual (Mr. J. B. Dunlop), who drove an F. N. cycle, showed splendid judgment.

The results in the various events were:—

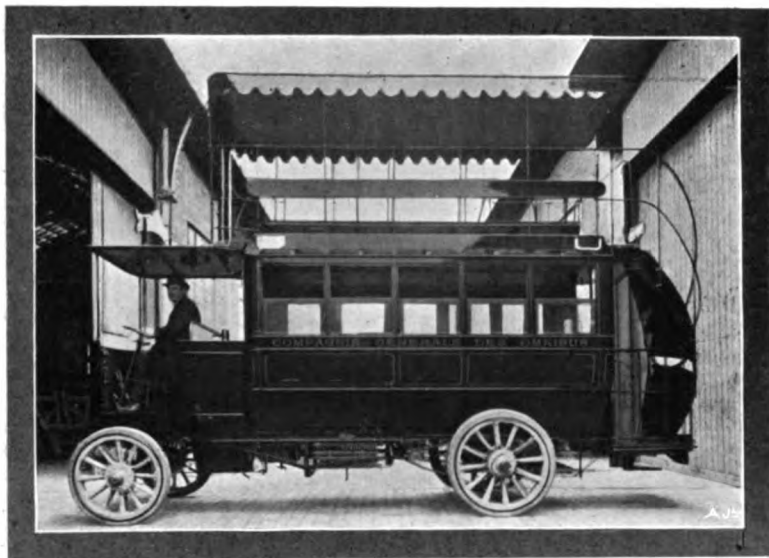
Novice Competition: One mile, standing start. Machines of unlimited weight under 3½-h.p.—A. E. Bannister, 2-h.p. Minerva. Time, 1 min. 33½ secs.

One mile, standing start, under 150 lbs. (without petrol or accumulators).—C. B. Franklin, 2½-h.p. F.N. Time, 1 min. 29 secs.

One mile, standing start (unlimited weight under 3½-h.p.).—C. B. Franklin, 2½-h.p. F.N. Time, 1 min. 31 secs.

A PARIS MOTOR OMNIBUS.

FOR once Paris has been somewhat behind London in automobile enterprise, the Compagnie Générale des Omnibus having only now completed its first 'bus for public service. The delay has, of course, been due to difficulties which we explained in the



The First Motor Omnibus of the Paris Compagnie Générale des Omnibus.

Journal at the time in regard to the obtaining of concessions, but these matters having been satisfactorily settled, it may be assumed that the development of the motor 'bus movement in Paris will now proceed at a rapid pace. Special interest attaches to the new 'bus, as it is a steam vehicle built by Serpollet on his well-known principles, and from the economic point of view is a novel departure, as the fuel employed in the burners for raising steam is heavy tar oil of much the same general composition as was employed by the County Council in their flarers during the London fogs. The new 'bus is a double-decked one, designed for carrying 14 passengers inside and the same number outside, and in general appearance somewhat resembles some of the County Council trams, as the passengers on the upper deck are protected by a light roof or awning. The chassis of the vehicle is of the most recent Serpollet construction, and the engine develops a nominal 40-h.p. The total weight ready for the road, but without passengers, is 3,500 kilogs., and it made its first official run very appropriately on May 1st.



A NOVEL method of taxation for motor cars is to be tried in Belgium. A tax of 50 francs per car is to be enforced, with an addition of 10 francs per h.p. The taxes up to the present have been according to weight.

THE British Consul in Honduras reports that the road in that Dependency, from Tegucigalpa to the Pacific Coast, is making satisfactory progress, and that before long there will be a demand for automobiles to run on it. When the Panama Canal is completed, if ever, business in Honduras will be, undoubtedly, much brisker, so that the whole district is one which will develop rapidly.

The Isle of Man and Automobile Visitors.—Mr. George Drinkwater, the president of the recently formed Manx Automobile Club, writes us in regard to the law affecting visitors to the Isle of Man. At present motorist visitors are allowed a sojourn of two months free of charge or registration, and in prospective legislation, which appears imminent, it is proposed to allow a stay of one month free of all charge, on report to the Highway Board on arrival of the car, of the owner's name and address, identification number, and driver's licence. Mr. Drinkwater hopes "reciprocity will be granted on equally liberal terms to Manx motorists visiting the adjacent Islands of Great Britain and Ireland." However much we echo Mr. Drinkwater's sentiments, we are afraid the public authorities of the "adjacent islands" are devoid of all sentiment when it comes to enforcing their rights.

THE Motor Car Emporium, Limited, have entered into arrangement with De Dion Bouton Company for the delivery of 110 heavy vehicle chassis. The chief object of this deal is the supplying of motor omnibuses for London, the first of which—a double-decked vehicle—we understand will be running in London within a fortnight's time.

GENERAL agreement seems to be growing up as regards the proper methods of really combating the dust nuisance. The Hon. John S. Montagu, who contributes an article on the subject to a recent number of the *Daily Mail*, enunciates practically the same views on the subject as our contributor, Mr. Lionel Rathbone, J.P., in a paper read before the Liverpool Self-Propelled Traffic Association, the first part of which we reproduced and commented on last week. It is satisfactory that something approaching a general consensus of opinion on the question has been evolved, as that is the first step to reformed views on the subject penetrating the somewhat slow moving lines of our highway authorities.

PUBLICATIONS RECEIVED.

- Blackheath Automobile Club Handbook*, 1905. Greenwich: The Blackheath A.C.
Cyclist's Companion. Road Guide, Bristol and District. Bristol: W. C. Hemmons, St. Stephen's Street. Price 3d.
The Competition Rules governing all Automobile Competitions which may be held in the United Kingdom, Isle of Man, or Channel Islands. London: The Automobile Club of Great Britain and Ireland. 6d.
Ordnance Survey Maps. England and Wales. East Yorkshire (Sheet 8), Norfolk and East Lincolnshire (Sheet 12), Central Wales (Sheet 14), and South-East England (Sheets 20, 24). London: Board of Agriculture and Fisheries. Price 1s. 6d., 2s., and 2s. 6d.
London Town. Illustrated with 40 views. London: Raphael Tuck and Sons. Price 1s. net.
Thrupp's North of England Cyclists' and Motorists' Guide (Illustrated). Bradford: T. Thrupp. Price 6d. net.
The Swift Road Book of England and Wales. London: The Swift Cycle Company, Limited, 15, Holborn Viaduct. Price 1s.

Catalogues.

- Brown Brothers, Limited. *Motor Catalogue*, 1905. Great Eastern Street, London, E.C.
 Smith, Parfrey and Company, Limited. Fulham Palace Road, Hammersmith.
 Blieriot Lamps and Horns. Weldhen and Blieriot, 54, Long Acre, W.C.



Photo by Lieut. W. Windham.
Snapshot of His Majesty the King on a 15-h.p. Darracq, at Bougie, during his recent Algerian visit.

"Encircling the World" Week by Week.—The strange and weird experiences of Mr. Glidden in his trans-mundane and trans-oceanic motor tour continue to grow in interest. In his run across Australia he encountered a number of elderly representatives of the aboriginal race, and he loaded his car up with some venerable old gentlemen of this persuasion, and had it photographed with the most patriarchal of them at the wheel. The aboriginal gentleman in his shirt-sleeves in the tonneau is holding a boomerang in his hand, an instrument which, as most people know, can be thrown into the air, and like a bad five-pound note, always returns to the hands of its projector. It might be useful to the Australian police for stopping drivers that refuse to pull up when called on, and perhaps the next Australasian development we shall have to recount will

be the training of constables and the organization of motor-car-boomerang-police-traps! The photograph to the right shows Mr. Glidden's car drawn up in front of some Australian oast-houses which, as will be seen, resemble the similar structures which are familiar objects in various parts of England.

In the current number of the *Car Magazine*, Mr. Scott Montagu makes a rather astounding declaration that "locomotion and alcohol are deadly enemies." Considering that both in France and Germany alcohol has been employed with great success for the propulsion of automotor vehicles, and that in this country we are agitating for a relaxation of the restrictions which prevent its being so employed here, the observation appears decidedly startling. Mr. Scott Montagu, however, is referring to the physiological and mental effects of alcohol employed as a beverage, so that once more we have a proof that the same thing may be looked upon from very different points of view.

THE Roads Improvement Association will hold their first annual dinner on Wednesday, May 17th, at the Trocadero Restaurant.

ONE of the gentlemen who are always ready to rush into print has written to a daily paper pointing out that the reason that road metal at the present day produces more dust than in MacAdam's time, is that then it was blasted by common powder and broken up by hand, while now it is blasted by dynamite, and crushed by steam. This, he supposes, makes the road metal more inclined to break up small and generate dust. Automobilists and others also often read the Commination Service over it, and this form of "blasting" may perhaps also produce its effect.



"Encircling the World" Week by Week—Mr. Glidden's Car in Australia.

At Weston-super-Mare a regular service of motor omnibuses has commenced running from the Light Railway Station to the Royal Sanatorium.

At the Manx House of Keys, on the second reading of the Motor Car Bill, it was decided to limit the speed in the Island to 14 miles an hour in view of the narrowness of the Manx roads.

A MEMBER of the Haywards Heath Urban Council, at their last meeting, gave it as his opinion that motorists ought to be made to carry a water-tank in front of them. Possibly he is not aware that that is already one of the most essential features of a motor car.

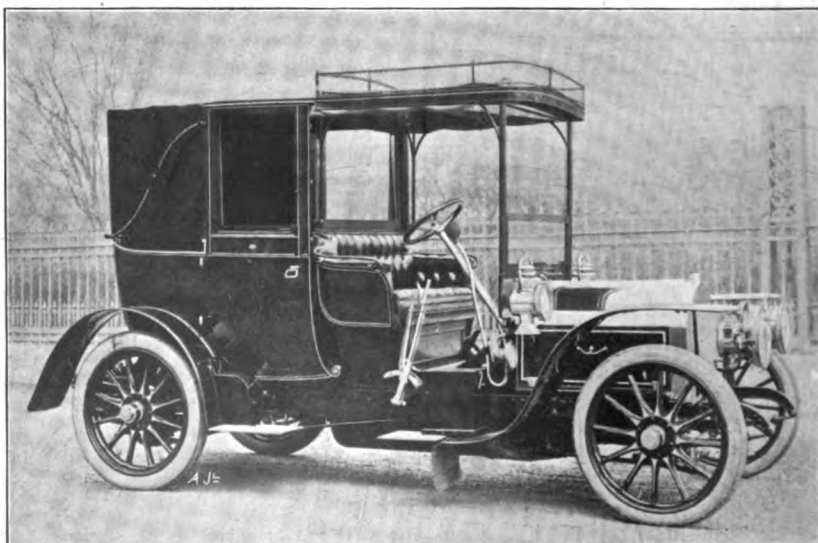
THE Leeds City Tramways Committee have decided to purchase two 35-h.p. heavy 'bus chassis, to be built by the Ryknield Engine Company, Limited, of Burton-on-Trent. All the work of the Ryknield Company is British throughout, with the exception of a few small details, and the work on these two chassis is to be pushed forward so that delivery may be made to the Leeds Corporation for the first week in August.

THE 20th (Artists) Middlesex V.R.C. have been granted permission to use motor transport vehicles during the period of the battalion's annual camp this year instead of horsed transport. The data thus obtained should help to swell the information being gathered together on mechanical transport by the War Office, with a view ultimately of adopting it more extensively for field service.

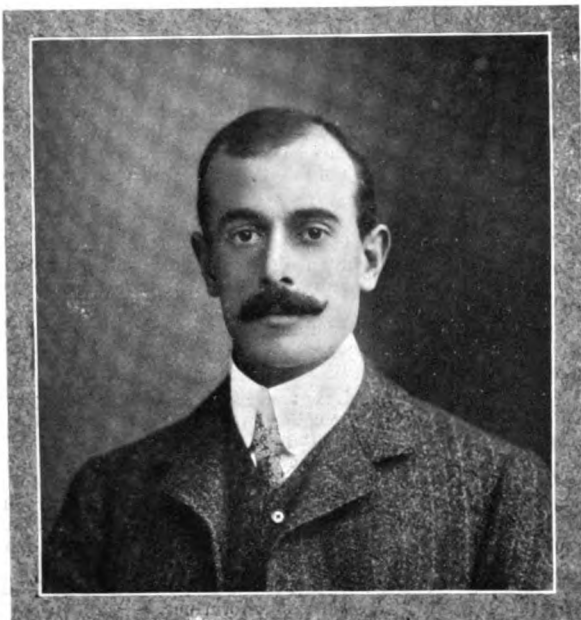
THE paper boys mounted on ordinary bicycles tearing through the streets with a load of papers on their backs, "as if the devil were behind them," as a London magistrate recently said, and scattering pedestrians right and left, as if they were travelling samples of globular lightning, are in all conscience bad enough. But since these same public terrors have taken to motor bicycles, they are worse than ever, while there is the greater weight of the machine to be considered, and its inferiority in stopping as compared with a motor car, to add to its dangers. One of these rough riders, with the Stevensonian name of John Silver, ran more than usually amuck with his motor vehicle near St. Paul's Station one day last week. When summoned at the City Summons Court for driving his machine to the common danger, the defendant objected to an adjournment for the remarkable reason that he had got another summons to answer next week, and one the week after that. A police constable gave evidence that he had been had up five times for furiously riding an ordinary bicycle, and the magistrate's clerk added the information that his motor bicycle licence was endorsed. Under these circumstances he got off very cheaply with 40s. and no costs, which the magistrate, with somewhat superfluous benevolence, remitted, for the reckless paper boy motorist really wants stopping.

THE continued growth and expansion of the automobile movement in India and the increasing market for British-built cars are among the most encouraging topics to which we have from time to time to refer. We are specially glad, therefore, to be able to announce that a regular motor car service of steam cars—Turner-Miesse—has been organised in connection with the Madras Railway between Bezwada and Masulipatam. The service which has been subsidised by the Postmaster-General of India by the grant of 500 rupees annually for carrying the mails, will consist of three Turner-Miesse cars, each designed for carrying eight passengers as well as mails and luggage, the whole arrangements having been carried out by the well-known Madras carriage builders, Messrs. Simpson and Co., who are the Indian agents of the company. The distance from Bezwada to Masulipatam, is 44 miles, the double journey being accomplished at an average speed of 22½ miles an hour, though, of course, speed was not the object aimed at. As the bullock carts which formed the only means of communication before the introduction of the automobile service take twenty hours to do what it accomplishes in five or six hours, the benefit to the inhabitants of the neighbourhood will be appreciated. It is appreciated by the citizens of Masulipatam, who have organised a company for financing the service, with a capital of 30,000 rupees, and the company intend adding two more cars to the service. One of the advantages of the system for use in India is, as our readers will recognise, that the cars employ ordinary paraffin oil, which can be obtained in the district for three rupees per 4-gallon tin.

THE stagnant Empire of China has not yet been appreciably opened up by the automobile. But there is one town, at any rate, in which the new locomotion is to be found very well represented for an Oriental town—we refer to Shanghai. The automobile, we learn, is already extremely popular there, and it is anticipated that European manufacturers and exporters will before long find the Shanghai automobile market exceedingly well worth keeping an eye on.



A new model in carriage work by Messrs. Hooper and Co. This specially-designed landaulette has a 16-h.p. De Dietrich chassis, and is the property of Mrs. Keating. This is one of the latest De Dietrich cars.



Mr. Seaton Edge.—Since his arrival in England Mr. Seaton Edge, the brother of Mr. S. F. Edge, has been intimately associated with the automobile work of his brother. It was Mr. Seaton Edge who steered Lord Howard de Walden's Napier boat at the Monaco Meeting, and not Mr. S. F. Edge, as was reported.

THE Directors of the Bath Electric Tramways, Limited, are believers in motor omnibuses as feeders to tramway systems. At the meeting of the Company held last week, at which Sir Vincent Calliard presided, the chairman, in referring to this important question, said :—

"We are going to adopt a system of motor omnibuses, in order to feed the traffic of the tramways and penetrate much further into the country in search of traffic than we could possibly do for a long time to come with electric tramways. With these motor omnibuses it is our present intention to serve Lansdown. The hill of Lansdown is so steep that it has not been considered safe to attempt to serve it by electric tram road. On the other hand, there is not the slightest danger in using motor omnibuses on a declivity as steep or steeper than Lansdown, and we hope in a very short time the inhabitants of Lansdown will find themselves gliding as comfortably up that steep mountain as if they were on a level plain. As to the country service, there are, as you all know, within a few miles of Bath, towns and large villages of considerable population which will be only too glad to have greater facilities for reaching Bath than can be afforded by train service, even if the railway runs near them, and the effect of running motor omnibuses to places of this kind will be not only to increase the traffic by the omnibuses themselves, but to feed the tramways."

THE bend of a shady Sussex lane, and Firle Beacon standing up above it, wind-swept and golden in the afternoon sunlight; the long note of an approaching horn, the rhythmic beat of horse hoofs at a swinging trot, the rattle of swindlebars, and the crack of the whip, and a swaying red vehicle sweeps along round the bend and disappears. It is the Brighton and Eastbourne coach, a relic of old times, carrying with it suggestions of the eighteenth century, something of the atmosphere of the days before railways—of Esmond and my Lord Castlewood—when the "new swift coaches" were first started that did the 54 miles from London to Brighton in the wondrous time of 5½ hours. It is remarkable how the stage-coach has survived on many country roads. Its picturesqueness has preserved it, and we should be sorry to lose it. So we are glad that we need not join in the wail of the *Daily Telegraph* that these

picturesque survivals of Old England are to be crushed out of existence by motor car services. Motor car services are doing splendid work as supplements and additions to the railways, but it is not as practical working means of communication that the old four-in-hands still run. They have been kept up in spite of the railways, and they will be kept up in spite of automobile services. At the same time, one of the chief charms of the four-in-hand was the way it enabled the traveller to see the country in a way that he never saw it by train, and, though they may not be so picturesque, the automobile services that are now being organised, and to which we have frequently referred, will enable these pleasures to be enjoyed by a much larger number of passengers than the few still remaining semi-private four-in-hands can accommodate.

A Useful Diet for Motorists.—The principal constituents which food ought to possess to be nourishing and sustaining, particularly in times of stress and severe demands on the vital energies, are mainly the albuminous substances generally known as proteids, of which the egg and milk are the most familiar examples. Modern science which has done so much in concentrating nutriment, has produced a material from practically these constituents in the form of a fine powder which mixed with farinaceous foods, biscuits, cakes of all sorts, or even chocolate, cocoa or other granular food stuffs in general use, enables the nutritive value of such materials to be very considerably increased. There are times during long journeys, and particularly during motor car racing, when the automobilist wants this kind of concentrated nourishment, and "Plasmon," one of the best known forms in which it is supplied to the public, gives him all he wants. In fact, the Plasmon luncheon basket which consists of about ¼ lb. of biscuit and the same weight of cocoa is stated to be sufficient to keep a man going and feeling fit for a whole day. Without completely replacing cruder forms of food under exceptional circumstances and for short periods, it is undoubtedly a very useful concentrated form of nutriment.



MONACO MOTOR BOAT MEETING.—"Dubonnet," the holder of the Motor Boat World's Record for speed, filling up her fuel tanks.

The Daimler Motor Company (1904), Limited.—An interim dividend of three per cent. on the preference shares has been declared by the directors.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or parts of their objects.]

A. R. Atkey and Co. (1905) (Limited).—Capital, £15,000 in £1 shares. Object, to acquire the business of A. R. Atkey and Co., Limited, at Nottingham, of engineers and dealers in automobiles, &c. First directors, A. R. Atkey and M. R. Browne.

Cars (Limited). 25, York Street, Portman Square, W. —Capital, £5,000 in £1 shares (2,500 six per cent. cumulative preference). Object, to adopt an agreement with Mrs. K. L. Shaw, and to carry on the business of manufacturers of and dealers in motor cars.

Cycloid (Limited), Star Life Building, Bristol.—Capital, £25,000 in £1 shares. Object, to acquire rights to an improvement in internal combustion engines operating on the four-stroke cycle, and having for its object the effective scavenging of the exhaust gases. First directors, T. G. Wright, M. E. Dunscombe, F. B. Bond, and P. King, M.D.

Derbyshire Motor Omnibus Company (Limited). Alliance Chambers, George Street, Sheffield.—Capital, £5,000 in £1 shares. Object, to run a service of motor cars or omnibuses between Baslow, Grindleford, and Bakewell. First directors, W. Robinson, B. Brittain, and J. Hind.

Excelsior Motor Tyre Company (Limited).—Capital £1,000 in £1 shares. First directors, W. J. McDonald, G. Sturch, and E. H. Donald.

Gobron Brillé British Motor Company (Limited).—Capital, £30,000 in £1 shares (15,000 preference). Object, to acquire the business of a manufacturer of and dealer in motor cars, carried on by J. Stenbury.

COMMERCIAL POINTS.

THE movement for employing motor coaches on railways is extending to Australia, and tenders are asked for, by the Agent-General for South Australia, for a motor coach to run at a maximum speed of 30 miles an hour, and accommodate 8 first and 10 second-class passengers. Particulars may be obtained from the Commercial Intelligence Branch of the Board of Trade, at 73, Basinghall Street, E.C.

IN the year 1900 the Lancashire Steam Motor Company supplied the Borough of Chelsea with one of their motor municipal vehicles. In 1903 two more of the same type of vehicle were taken by the Chelsea authorities, and now they have repeated their order for one of the company's standard combined tip wagons and 1,000 gallon watering tank vehicles.

MESSRS. JARROTT AND LETTS have sent us an interesting communication from one of their clients which proves once again the remarkable hill-climbing capabilities of the little 7-h.p. Oldsmobile car. The owner of one of these vehicles recently made a trip from Oxford into Devonshire, and succeeded in scaling without difficulty, with two people up and a heavy load of luggage, the fearsome Porlock Hill and the even worse hill up out of Lynton which was at the time covered with loose stones. Quite powerful cars have before now refused both these hills even with the surface in good condition, so it is hardly to be wondered at that Messrs. Jarrott and Letts are proud of this performance.

A FAINT idea of the number of tyres used in the bicycle and motor car trade may be gathered from the fact that the Continental Caoutchouc and Gutta Percha Company, of Hanover, are at present turning out 6,000 tyres per day, this output necessitating working day and night. In motor tyres we learn that they are turning out double the quantity they were this time last year.



BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E., Thanet House, Temple Bar, London.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

7563. 30th March, 1904. Improvements in or relating to Internal Combustion Engines. Ganz & Co., Eisengiesserei und Maschinenfabriks Actiengesellschaft of Ratibor, Germany. This invention relates to an improved form of engine, the principal feature of which consists in the provision of a small auxiliary explosion cylinder, the operations in which are approximately the same as those of the main-

and a charge of fuel by the pipe, *c*, to the chamber, 11. During the upstroke of the two pistons the air in the power cylinder and the explosive mixture in the auxiliary cylinder are compressed. At the end of the compression stroke explosion takes place in the auxiliary cylinder, and the products pass into the power cylinder. The rapid flow of the combustion gases in the passage, 3, will cause the fuel to be drawn from the chamber, 11, in the form of a spray. The fuel drawn into the power cylinder will thus be ignited as it passes into the compressed air, producing a working stroke in the cylinder, *a*. The products of combustion are expelled from the cylinders through the exhaust valve, 18. April 27th, 1905.

1229. January 21st, 1905. A New or Improved Two-Stroke Cycle Internal Combustion Motor. G. von Riedel, 16, Winkelmansstrasse, Vienna. The object of this invention is to obtain in an improved two-stroke cycle internal combustion engine a higher efficiency by providing an abundant supply of air for scavenging purposes and by preventing loss of fuel. There are two figures. Fig. 1 is a section of the cylinder in a central plane. The piston is of two

of the piston, *a*, to the upper side of the piston, *a*, in the cylinder, *c*. On the return stroke the ports, *g* and *e*, are covered by their respective pistons, and the air is compressed in the cylinder, *c*, at the same time being mixed with fuel which is delivered through the port, *h*. The mixture is then ignited and the same operations are repeated. April 27th, 1905.

Patent Specifications Published.

Applied for in 1904.

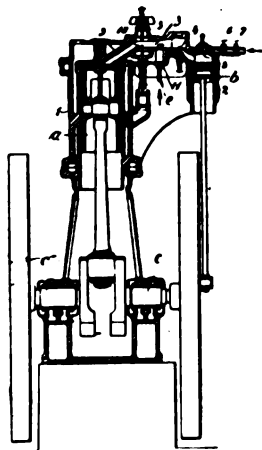
Published May 4th, 1905.

- 10,607. G. AND H. P. DILLIG. Differential gearing.
- 10,741. A. T. REID AND J. REIKIE. Driving axles.
- 10,971. N. W. H. SHARPE. Cut-out for silencers.
- 11,106. E. D. HOLMES AND C. J. HEATON. Speed indicator.
- 11,548. H. W. BAMBER AND F. E. ANDREWS. Intl. combn. engines.
- 11,561. T. D. KELLY. Intl. combn. engines.
- 11,642. F. SADLER. Tyres.
- 11,880. ALHION MOTOR CAR CO., LTD., AND T. B. MURRAY. Magneto-electric generators.
- 13,646. F. D. LYON AND G. W. BROWN. Tyre non-skidders.
- 13,678. J. M. M. TRUFFAULT. Driving gear.
- 14,901. J. E. THORNYCROFT. Motor vehicles.
- 17,287. F. T. WONNACOTT. Variable gears.
- 23,990. SODEN-FRAUNHOFEN AND DAIMLER MOTOREN GES. Starting device.
- 29,269. L. J. AND T. G. GAUTREAU. Carburetors.
- 29,370. A. DE DION AND G. BOUTON. Friction clutches.
- 29,371. A. DE DION AND G. BOUTON. Friction clutches.
- 29,372. A. DE DION AND G. BOUTON. Friction clutches.
- 29,373. A. DE DION AND G. BOUTON. Friction clutches.

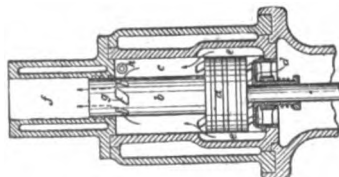
Applied for in 1905.

Published May 4th, 1905.

- 463. B. M. ASLAKSON. Intl. combn. engines.
- 1,056. H. J. MULLINER AND G. H. SMITH. Hand shield.
- 4,634. J. G. MOSS. Anti-skid device.
- 5,343. T. H. AND E. GARDNER. Governing devices.



power cylinder. There are four figures. Fig. 1 is a sectional elevation in a central plane; 1 is the main-power cylinder and 2 the cylinder of the auxiliary engine, and *a* and *b* are their pistons respectively. Both pistons are connected to the crank shaft, *c*, so that the pistons work together, the upstrokes and the downstrokes of each taking place at the same time; 3 is a passage connecting the cylinder, 1, with the cylinder, 2. The cylinder, 1, has a suction inlet valve, 5, through which air enters, while the suction inlet for the cylinder, 2, is at 8. The cylinder, 2, has also atomisers, 6 and 7, by means of which it receives fuel and water. In the suction stroke the main cylinder draws air through the valve, 5,



diameters, the smaller diameter, *b*, being securely fixed to the end of the larger diameter, *a*. The smaller diameter, *b*, reciprocates in the exhaust cylinder, *f*, while the larger diameter, *a*, works in the working cylinder, *c*. The piston, *b*, has ports, *g*, in its cylindrical wall. During the instroke of the piston air is drawn by suction into the lower part of the cylinder through the valve, *d*. During the greater part of the downward travel of the piston this air is compressed in the lower end of the cylinder. As soon as the piston approaches its lowest position the ports, *g*, are uncovered, and the products of combustion begin to escape and are at the next moment entirely ejected by the air, which now flows through the ports, *g*, from the lower side

The Automotor Journal, May 13th, 1905.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

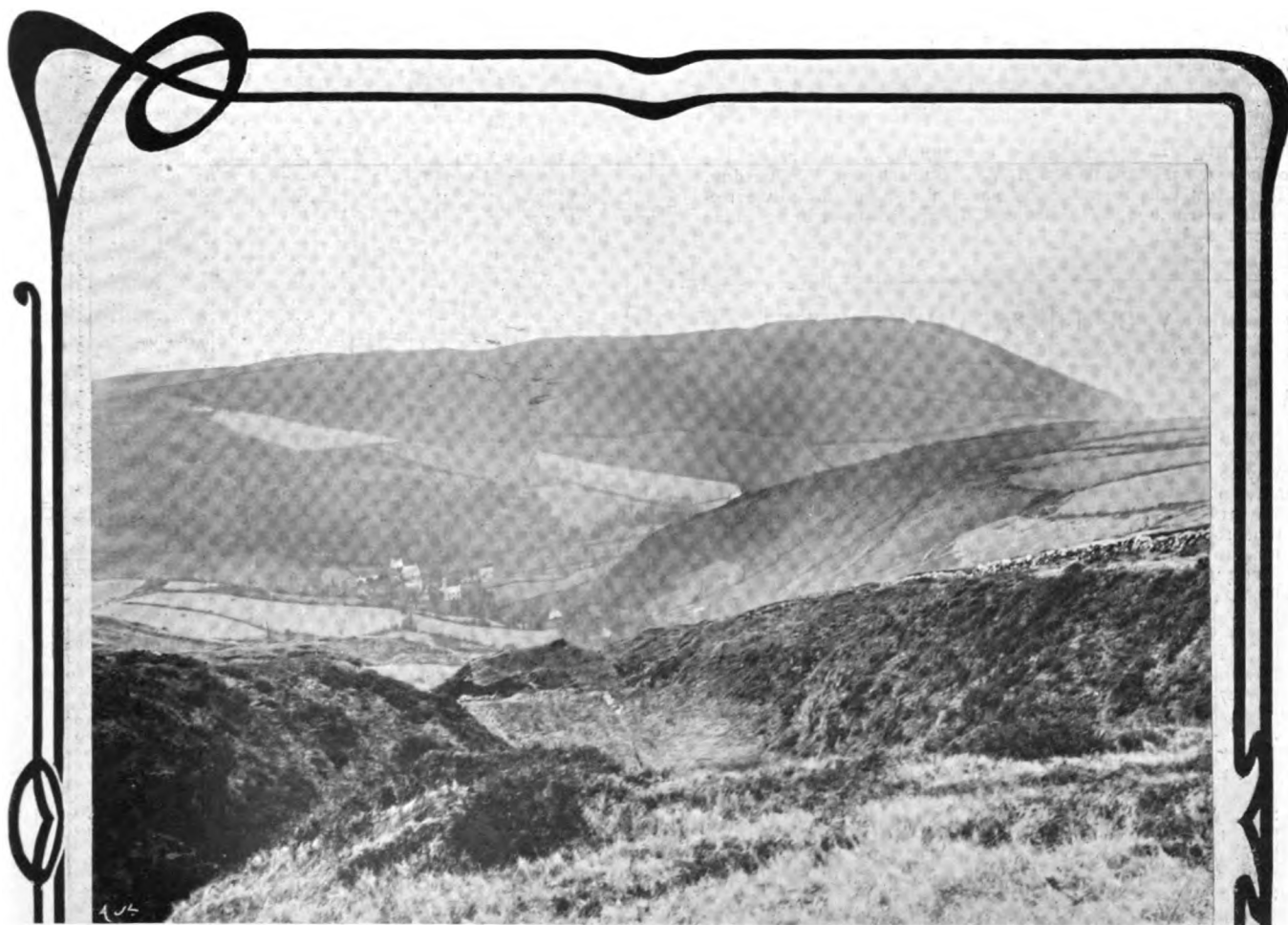
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ISLE OF MAN COURSE.—A glimpse of the surrounding country as seen from the mountain road, looking to the right.

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DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
May 13 ...	Auto Cycle Club Members' Penalty Run.
May 20 ...	Motor Union Inter-Club Meet (Welbeck).
May 20 ...	200 Miles Trial (Motor Cycling Club).
May 30 ...	*Gordon-Bennett British Eliminating Trials.
May 31 ...	Auto Cycle Trials and "Selection" Race.
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.).
June 10 ...	London-Edinburgh (Motor Cycling Club).
June 14 ...	Bexhill Race Meeting.
June 24 ...	100 Miles Passenger Trial (Motor Cycling Club).
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 8 ...	Auto Cycle Club Consumption Trial.
July 12 ...	*Hill-Climb (Henry Edmunds Trophy).
July 19-22 ...	*Brighton Speed Races.
July 27-28-29 ...	*Blackpool Motor Meeting.
July ...	24 Hours Run (Motor Cycling Club).
Aug. 2-3 ...	*Motor Boat Trials (Southampton).
Aug. 11 or 18 ...	*Quarterly 100 Miles Trials.
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 26 ...	Inter-Team Trial (Motor Cycling Club).
Sept. 9 ...	Brown Cup (Motor Cycling Club).
Sept. 12 ...	Auto Cycle Club Race Meeting.
Sept. 14 ...	*Tourist Trophy (Isle of Man).
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).
Sept. 20, Oct. 24 ...	*Van Trials.
Oct. 4 ...	*Speed Trials.
Nov. 10 or 17 ...	*Quarterly 100 Miles Trials.

* Automobile Club of Great Britain and Ireland Events and Papers.

Nov. 17-25 ... Society of Motor Manufacturers and Traders Exhibition at Olympia.

Foreign Events (Trials, Races, &c.).

1905.	
May 6-14 ...	Auto Cycle Club de France Tour.
May 11-25 ...	Stockholm Automobile Exhibition.
May 15-17 ...	Italian Tourist Trial (A.C. Milan).
June 16 ...	French Selection Race for G.B.
June 23 ...	International Motor Cycle Cup.
June 20-28 ...	Aix-les-Bains Week.
July 1 ...	Boulogne-Cape Gris-Nez (Motor Boats).
July 5 ...	Gordon-Bennett Race.
July 9-22 ...	Ostende Automobile Meeting.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Boulogne-Folkestone (Motor Boats).
July 16 ...	Mont Cenis Hill Climb.
July 20-26 ...	Paris-Trouville (Motor Boats).
July 28-Aug. 8 ...	Paris Industrial Vehicles Trials (A.C. France).
July 30 ...	Gaston Menier Cup (Motor Boats).
July 31 ...	Anthony Drexel Cup (Motor Boats).
Aug. 6-7 ...	Circuit des Ardennes.
Aug. 10-16 ...	Herkomer and Bleichroder Races.
Aug. 12 ...	International Cup for Motor Boats.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Tri-Car Competition (L'Auto).
Sept. ...	Vincenzo Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.
Sept. ...	Tourist Car Trial (A. C. de France).
Sept. 3-10 ...	Royan Meeting.
Sept. 3-10 ...	Spa Automobile Club.
Sept. 11 ...	British International Cup (Motor Boats Arcachon).
Sept. 12-14 ...	Lake Lucerne Motor Boat Meeting.
Oct. 1 ...	Chateau Thierry Hill Climb.
Oct. 15 ...	Gaillon Hill Climb.

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upon legislation, and plenty of it, as the cure to all possible ills, particularly in times of panic, but one would have thought that it must be apparent to Members of Parliament, even of the calibre of Mr. Cathcart Wason and Mr. Channing, that legislation, however draconic, cannot do everything. However drastic the law may be, experience shows that there will always be a small number of individuals who will break it. But the remedy is not further legislation, particularly as in the case of the Motor Car Act it can scarcely be made more severe than it is. It is perhaps as well that Mr. Wason and Mr. Channing have broken out thus early, when the weather is still comparatively cool and the next Motor Car Bill as yet comparatively remote. Had they had the excuse or occasion for doing so at a later date, their efforts might not have been followed by the inevitable reaction (which has now plenty of time to set in in favour of the automobile movement) before it becomes necessary to consider the next Bill on the subject.

With His Usual Inaccuracy.

It is one of the advantages which animus always gives to the *other* side, that speakers suffering from it are almost invariably inaccurate. Mr. Wason is no exception to this rule. In fact he is a conspicuous instance of its operation, but inaccuracy even with an excuse of this kind should have its limits, particularly when it takes the form of disingenuous innuendo embodied in a question. Mr. Wason solemnly asked in the House on Thursday last week whether the President of the Board of Trade would take steps "to reconsider the circular issued by the Local Government Board directly taking away the power of local authorities to regulate traffic in their own district." Could a more ludicrous perversion than this of the action of the Board be put forward in a single sentence? Of course the "power" of regulating their own traffic suggested in the question means the 10 mile an hour speed limit, but local authorities never possessed this power, and could only apply to the Local Government Board to impose the limit. The circular thus inaccurately referred to is the one in which the Board very sensibly dissuades County Councils and similar bodies from making such applications. To represent this circular (in the form of a question) as depriving the local authorities of power to regulate the traffic in their own district—a power which in this sense, as stated, they never possessed—is carrying disingenuousness and false suggestion to a point which we are happy to say that only anti-automobilists, and only extreme anti-automobilists at that, seem capable of.

The Juggernaut Again.

NEEDLESS to say that when Mr. Wason is "up" in the Commons, the Juggernaut once again "rears its awful form" in the columns of the daily Press. A correspondent of a daily paper has been perpetrating another of the many inventions designed to render exceeding the 20-mile speed-limit, if not impossible, at any rate extremely unpleasant and inconvenient to those on board the offending car. The genius in question, who signs himself "Anti-Juggernaut," proposes the employment of some sort of loud and specially strident whistle, with which it will be both mechanically impossible and legally punishable for anyone on the car to interfere. This whistle is to be set in action automatically as soon as a speed of 20 miles an hour is reached, while its sound will increase in ferocity the more the limit is

PASSING EVENTS.

An Automobile Alien Bill.

ON the whole, we are in favour of the principle of the measure which the Hon. John Scott Montagu introduced on Tuesday last into the House of Commons to amend the law in regard to the issue of licences to alien motor car drivers. As everyone is aware, no restrictions are imposed in any way upon a person desiring to obtain a licence in this country. Amongst professional drivers, there are a large number who are not British subjects, but are, in the strict meaning of the term, aliens. The majority of them, of course, hail from France, where a certain proficiency is required before a driver's certificate is granted, and where, if he is reckless or comes into contact too much with the police, he is liable to be deprived of it. If a driver in this country has had similar adventures they are invariably endorsed on his licence. But there is nothing to prevent a French driver, who has become too well known to the authorities in his own country, from coming over here, and starting a fresh career with a perfectly clean licence. If, where he is not a British subject, enquiry could be made as to his past as a driver when he applies for a licence, the tendency would be for such a regulation to act as a safeguard. If he has never had a licence before, or if he has a clean one abroad, no harm will be done, whereas, if he has been a notoriously reckless motor car driver abroad, that fact would emerge. It is to be hoped, therefore, that Mr. Scott Montagu's measure will be passed into law.

The Revival of Mr. Wason.

THE unfortunate crop of motor car accidents on which, owing to the tragic consequences of some of them, the attention of the public has been recently concentrated, have had a further lamentable result (which we knew they were sooner or later certain to produce)—they have brought up Mr. Cathcart Wason in the House of Commons asking questions and generally wanting to know—don't you know—the sort of things he wanted to know during the dog days of 1903. To him was joined Mr. Channing, and the two of them were very anxious for further legislation, in spite of the elaborate explanations given to them by Mr. Grant Lawson on behalf of the Local Government Board that the law as it exists at present is amply powerful enough. It is astonishing how a certain class of person looks

exceeded. This, it is suggested, will be of benefit to the police in collecting evidence as regards the speed of a car, and will make everybody very happy and comfortable, as the approaching road-hog and auto-hooligan will be heralded (instead of followed) by frightful shrieks! But what nonsense the whole thing is! The anti-Juggernaut whistle would not sound at all at 19½ miles an hour, and imagine the havoc that would be wrought by a car driver who persisted in driving through such a suburb as Harlesden (where "Anti-Juggernaut" resides) at that pace, irrespective of the traffic that happened to be on the road. It is unfortunately troublesome to overcome all the difficulties and solve the problem of satisfactorily accommodating the new locomotion on our highroads to existing conditions. But the trouble is being overcome by the gradual education, as we pointed out in our last number, of the public to the different traffic conditions now prevailing, by the growth of a careful and considerate spirit amongst even the less careful automobilists, and by the elimination of the road-hooligan and the road-hog, by the sensible methods designed and now being carried out by the Automobile Club. The satisfactory solution of the problem cannot be expected instantaneously. The reckless motorist is a criminal and nothing else, and the elimination of criminals in any particular walk of life is a slow and laborious process. It is one that is not facilitated by hysterical outcries for panic legislation or ludicrously impracticable proposals that make every thoughtful man who has considered the question smile as soon as they are enunciated.

♦ ♦ ♦ Opposition in an Unexpected Quarter.

EASTBOURNE has been a pioneer in introducing and successfully running under municipal control an extensive service of motor 'buses. In fact that popular seaside town has provided one of the most impressive object lessons in the reliability of an adequately managed motor 'bus service, and of the use and real value it can become both for the regular inhabitants and for coping with very considerable influxes of special holiday traffic. By its means, all the popularly vaunted benefits of an electric tram service have been secured without any disfigurement of, or interference with, the streets and promenades of which the town is so justly proud. When corporations or municipalities elsewhere have been considering the introduction of the motor 'bus, and have been hesitating on the question, it has been customary to send them to Eastbourne, and a visit there has invariably had the salutary effect of completely converting them to a belief in, and acceptance of, the motor 'bus as the best means of dealing with municipal traffic. It is, therefore, much to be regretted that opposition on the part of the inhabitants (which has hitherto been conspicuously absent) is now manifesting itself in regard to the proposed further extension of the Eastbourne motor 'bus service. The opposition has culminated in a memorial to the Town Council against allowing an extended service to run along some of the principal roads connecting the new and old towns. It is significant that the protest is by no means numerously signed, and practically the only grounds brought forward by the protesters is that they dislike the noise, dust, and smell of the motor omnibuses. Well, as everybody knows who has visited the town, the Eastbourne motor omnibuses are comparatively noiseless. If they do raise dust, which is certainly not usual there, it is entirely the fault of the

Corporation themselves, which has always hitherto made a point of adequately watering its streets, and as regards odour, that, as most people are aware, is one of the ancient legends which protesters against automobile transport invariably serve up, but which has long ceased to have much practical basis in fact. The Eastbourne Corporation have been so successful with their motor 'bus service, it has proved so useful to the town, and so remunerative as an undertaking, that we do not fear that its further extension is likely to be seriously interfered with by the interested opposition of a few householders along the line of route, and it would certainly be a great misfortune if anything should occur to interfere with the popularity and success of the Eastbourne motor 'bus service or impede its further development, if for no other reason than that the town has been so long in the van of progress in this respect. The objectors ought to bear in mind that a town of the importance and population of Eastbourne absolutely requires means of mechanical public locomotion, and that but for the timely introduction of the motor 'bus they would have been probably saddled with an elaborate electric tram system which, in addition to its manifold abominations, would have probably severely strained the financial resources of the municipality.

♦ ♦ ♦ The Coming of the Motor Cab.

THE energetic action of the London Cabmen's Union in gradually and unostentatiously training a large number of former cabmen to become expert motor car drivers, with a view to utilising their services for motor cab development, is at length producing its effect. We hope that motor cabs will soon be forthcoming for all of the large number of men who are reported to be receiving instruction, but whether they are or not, the men will certainly never regret having added to their usefulness by the course of training they have gone through, for unquestionable as is the future of the motor cab, there is no doubt whatever that in a very short time the demand for drivers for motor 'buses will be largely in excess of the supply.

We are rather sorry to see that, while progressive in the manner indicated, the Cabmen's Union is setting its face against the taximeter, the introduction of which has again been proposed in connection with motor cabs. We have very little doubt that the introduction of the taximeter in conjunction with the motor cab would give the latter an additional advantage over its horse-drawn rival. One of the principal causes that interferes with the ordinary cabman's business, whether he be the driver of an up-to-date hansom or the careful pilot of a more or less dilapidated growler, is that, except the very small number of people who know London from end to end practically as well as the cabmen themselves, no one can really tell what the fare from place to place is. If at the end of a journey too little is offered, the unfortunate "fare" is too frequently treated to a choice selection of the language for which the London cabman has for so long been famous. If he offers too much, the flow of language is even more forcible, for the cabman then thinks he has got a victim from whom almost anything can be extracted. With the taximeter, as employed in the principal European towns where it has been introduced, undignified disputes between cabmen and their fares, such as are almost a feature of London life, are completely eliminated. But the tips are not eliminated—quite the reverse, in fact—

and it is apparently because they think the tips will be eliminated that the Cabmen's Union are against the introduction of the taximeter. On the contrary, when a customer is certain that it is impossible for the cabman to overcharge him, he is much more willing to give the latter a considerable *douceur*. Of course, there is one difficulty about the use of the taximeter, and only one. The cabdriver, when he thinks a customer is unacquainted with London, may not take the most direct way to the place he is engaged to drive to, but this is not a very serious matter, and can easily be dealt with by the police, as is done in Continental towns, where it is simply treated as fraud on the customer (which it is), and when brought home is dealt with vigorously by the police accordingly. We are inclined, therefore, to the belief that the introduction of the taximeter on motor cabs would benefit both the public and the cabmen who drive them, and that the opposition to the taximeter is short-sighted and mistaken, as it has been adopted in cities like Berlin and Hamburg, after some little friction, with perfect success, and the prosperity of the cabdrivers, since its introduction, has distinctly increased rather than diminished.

* * *

A Railway Company Following our Suggestion.

ON many occasions we have advocated the utilisation of moribund or derelict canals for motor boating, and the organisation of some of them on such a basis as to make travelling on them by self-propelled craft really enjoyable. A proposal of the kind was specially put forward by us in reference to the Woking and Basingstoke Canal, when that semi-defunct waterway came (without result) to the auctioneer's hammer. It is pleasing, therefore, to learn that the Great Western Railway Company, which is in every way showing itself the most progressive of our railway systems, proposes to adopt an idea of the kind, and to arrange the Kennet and Avon Navigation—a fine canal of 57 miles in length, which is the property of the Railway Company—as a special “run” for motor boats. The average depth of the water is well over five feet, which should be more than ample for the purpose. The scenery is charming, and all that would be needed would be a few good up-to-date hotels and restaurants on its banks, with perhaps special facilities to the owners of motor boats for transferring them thither from London. The further end of the canal communicates with the Bristol Avon, so that an exceedingly attractive motor boat tour could be made by extending the run along that river; the canal can be entered from the Thames at Reading. Not the least important aspect of this suggestion is the recognition of the immense and growing importance of the motor boat which it provides. It is too much to expect that just at first the traffic will actually pay, though soon it is quite possible it may do so, and the Company would, perhaps, be well advised to equip the rejuvenated canal with a motor boat service of their own. Considering the initiative which they have displayed in arranging motor 'bus services, it is not too much to expect that they may take the scheme in hand, and then they will probably net two profits, the hire of the boats, and the fares of intending passengers from London to the canal.

* * *

Commendable Enterprise.

OUR readers will remember that we have on several occasions drawn attention to the contracts which the Government of Ceylon offered for public competition

for supplying a public motor car mail service along certain roads in that island. The conditions of the contract were, as we observed at the time, decidedly onerous, and subsequently the local Press seemed of opinion that the description given of the routes were hardly fair to possible contractors. In the light of this information we wrote as follows:—

“It would appear from the *Ceylon Observer* that a very destructive criticism of these contracts has been made, and from the strictures published, the description of the roads over which the service is proposed to be run would certainly seem to be exceedingly misleading. Doubt is thrown on the correctness of the grades given, and one of the roads stated, it is said, to be in fair order, is practically impassable for some months together owing to lack of rain and proper foundations. If these statements are correct, it will be a very serious matter for the intending contractors, as they are practically certain in such case to incur heavy loss, since, as will be remembered, £100 has to be deposited with the tender, and £400 more within a fortnight after the tender has been accepted, and cash security for an equivalent of a half-year's subsidy within three months of the second deposit.”

The truth of these statements was evidently widely recognised, and the Government of Ceylon received only one tender from this country, and none at all from local contractors. That the Government really want the service, however, and that they were perfectly sincere in desiring to organise one, is shown by the fact that they now propose to take it up themselves and experiment in the sphere where they find private enterprise has refused to step in. We wish them every success, as the development of Ceylon by automobile means is an object to which everyone must be sympathetic. But should the occasion recur at a later period for similar contracts to be asked for, we think it would be more conducive to the interests of all concerned, should a more complete disclosure of facts be made in the first instance.

— — —

ONE would certainly like to know whether the pronouncements of the clergy in the pulpit are, or are not, exempt from the law regarding contempt of court which regulates and controls the utterances of ordinary mortals. We raise the question, as a bishop is recently reported to have delivered himself, in the course of a sermon at St. George's, Hanover Square, to the following effect:—“There is a certain inhuman element coming over the nation. Would it have been thought that men should be so inhuman as to inflict needless suffering and death on some poor innocent little child as they fly on their way over the country? The Pharisees and the Sadducees were philanthropists compared with these motorists, for they, at least, did not cause the wounds of the man they passed by on the roadside.” There can be no doubt in the mind of anybody who reads this passage that the right reverend prelate is referring to a recent accident in connection with which the driver is now awaiting trial. Had such a remark been made by a “profane” speaker, or constituted editorial comment in an ordinary newspaper, it would undoubtedly be considered a very bad case of contempt of court. Apart from the legal aspects of the case, such remarks offend against one's sense of fairness. There may be jurymen, having to try a certain case, who would view a Bishop's remarks as of quite exceptional weight.

HERKOMER TRIAL AND BLEICHRODER RACE.



Fig. 1.—The start for the Kesselberg Hill-climbing Competition, just before the village of Kochel. On the right, a typical kilometre stone will be noticed.

Fig. 2.—The Serpentine Road at the beginning of the ascent of the Kesselberg.

HERKOMER-BLEICHRODER RACE.—THE BIG MOUNTAIN CLIMB.

SEVERAL months ago we gave the leading particulars of these two important events, which are to take place in August under the combined auspices of the Bavarian and German Automobile Clubs. We also reproduced several interesting photographs of some of the prominent views on the course. We have now received a further batch of characteristic photographs referring specially to one of the most important items in the programme of the trials, viz., the climb up the Kesselberg Mountain. From these, which have been taken recently when snow has dominated the country, the general character of the road which must be surmounted in ascending this mountain can be easily realised. Not only is the scenery of the country through which this particular test will be run of a magnificent description, but during the rest of the trial, which includes a 900 kilometre circuit for touring cars, the competitors will traverse some of the quaintest towns and most picturesque scenery in the south of Germany.

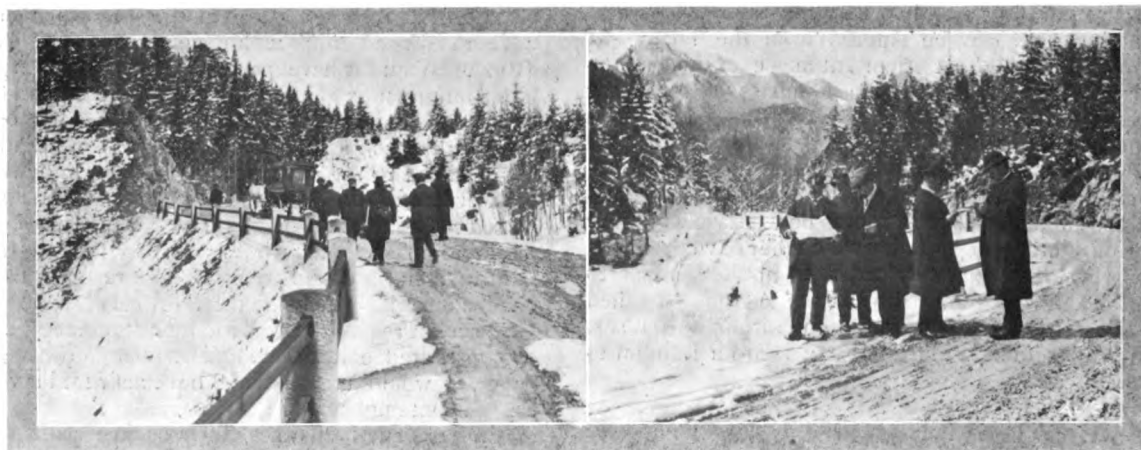
The Herkomer Trophy is only open to touring cars,

and of these at least fifty must be entered by May 31st, otherwise the event will not take place. This competition is divided into three sections, viz:—

Section 1. The exhibition taking place on August 11th in Munich, when the awards will be made upon the quality of the carriage work, springs, steering, protection from weather, accessibility, &c.

Section 2. Speed trials (two days). (a) August 12th, Kesselberg Hill Climb (7 kiloms.). (b) August 13th, speed trials in the Förstenriede Park (6 kiloms.). In the speed trials on August 13th cars will be classed according to horse power, viz., up to 16-h.p., 32-h.p., 60-h.p., and over 60-h.p.

Section 3. A three days' reliability run for touring cars through South Germany, over a distance exceeding 900 kiloms. In this, starting from Munich, the first day's run will be to Baden-Baden (359.7 kiloms.), the second day to Nürnberg (328.1 kiloms.) will be the stopping point, and the third day Munich will again be reached (236.9 kiloms.).



Figs. 3 and 4.—The Racing Committee of the Bavarian Club examining and arranging details for the course. These photographs are at a point half-way up the mountain.

HERKOMER-BLEICHRODER RACE.—THE KESSELBERG CLIMB.



Fig. 5.—During the ascent, magnificent views are obtained. In this photograph, a glimpse of the Kochelsee is seen through the pine forest.

Fig. 6.—A Dangerous Corner of the Course.

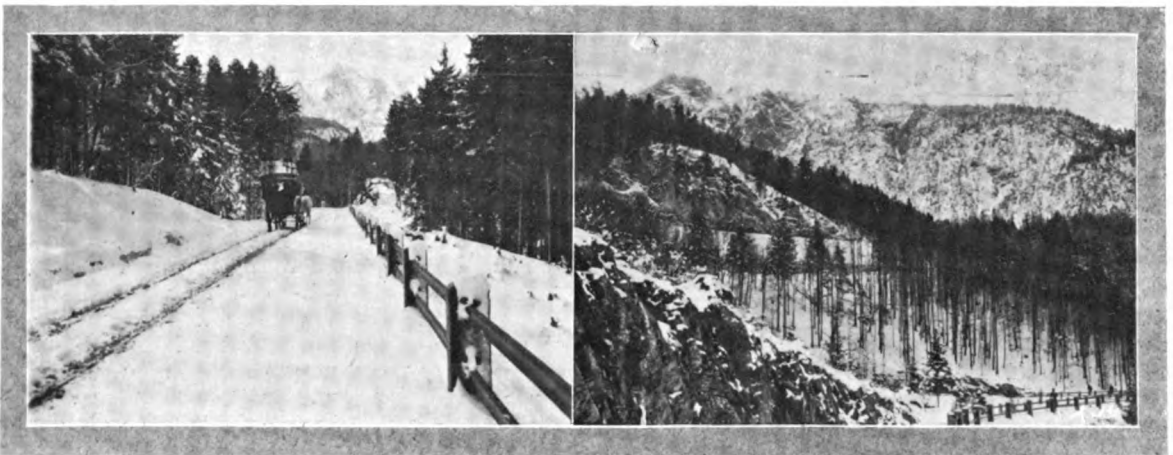


Fig. 7.—Another view half-way up the Mountain.

Fig. 8.—The upper portion of the Serpentine Mountain Road, with Memorial erected in celebration of the construction of this remarkable road.

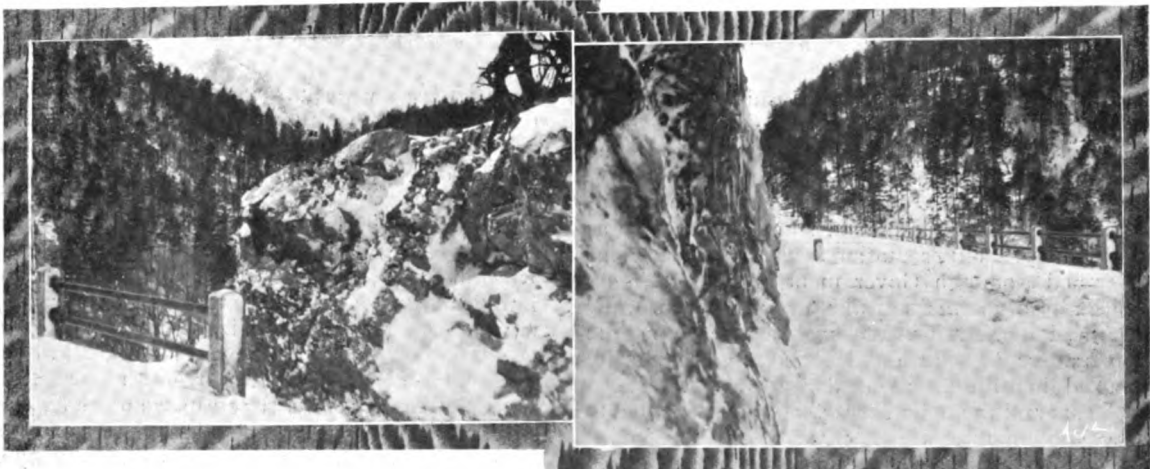


Fig. 9.—The finishing point of the Kesselberg Hill Climb. The protruding rock to the right in the picture is the pitch selected for the Judges and Timekeepers. The Mountain seen in the distance, at the back, is the Herzogshand, 1,757 metres high.

Fig. 10.—The end of the Race up the Mountain, looking towards the finishing point. This spot is 200 metres below the actual summit of the Mountain.

HERKOMER-BLEICHRODER RACE.—THE KESSELBERG CLIMB.

The awards will be made by means of marks, in which speed on the special tests, on the hill, brakes, &c., will be taken into consideration.

In regard to the Bleichröder Race, this takes place on August 12th and 13th, at the same time as the Herkomer Competition speed tests. This will also consist of two tests, viz., the Kesselberg Hill Climb (7 kiloms.), and the speed races in Förstenriede Park (6 kiloms.). Cars must not exceed the maximum weight of 1,000 kilogs., and competitors will be divided into three classes, viz., (1) up to 1,000 kilogs.; (2) up to

650 kilogs.; (3) up to 400 kilogs. The organisers are particularly anxious that Great Britain should be strongly represented in these important events, not only because the race is international, but also owing to the fact that Professor Herkomer, whose important trophy in this race is to be the great prize, has been for many years known so prominently to and so intimately associated with the British public.

The secretary of the Bavarian A.C. at Munich will be glad to extend every assistance to likely competitors, who may apply to him in connection with the fixture.

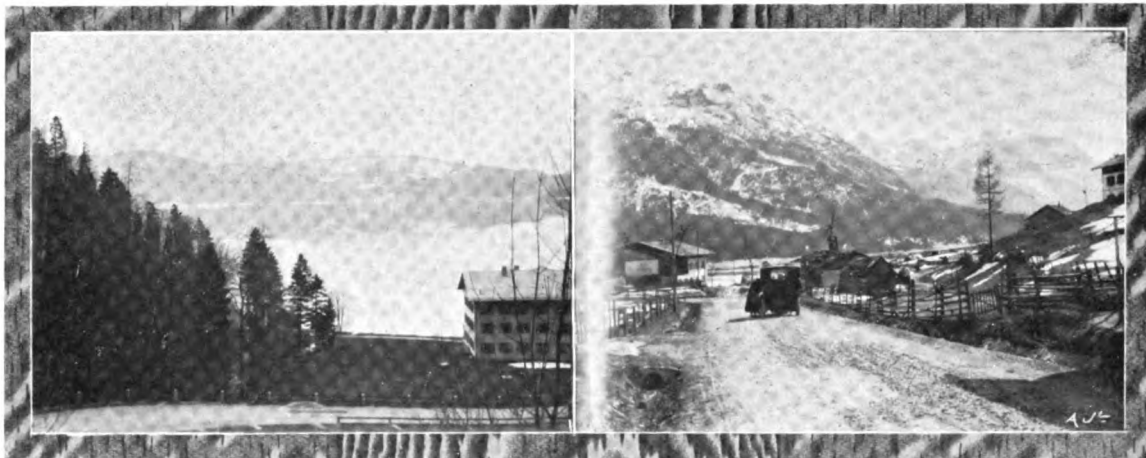


Fig. 11.—The Walchensee and Karwendelgebirge, a 3,000 metre Mountain.

Fig. 12.—A closer view of the Karwendelgebirge, near Walgan, 6 kilometres from the Walchensee.

HERKOMER-BLEICHRODER RACE—THE KESSELBERG CLIMB.



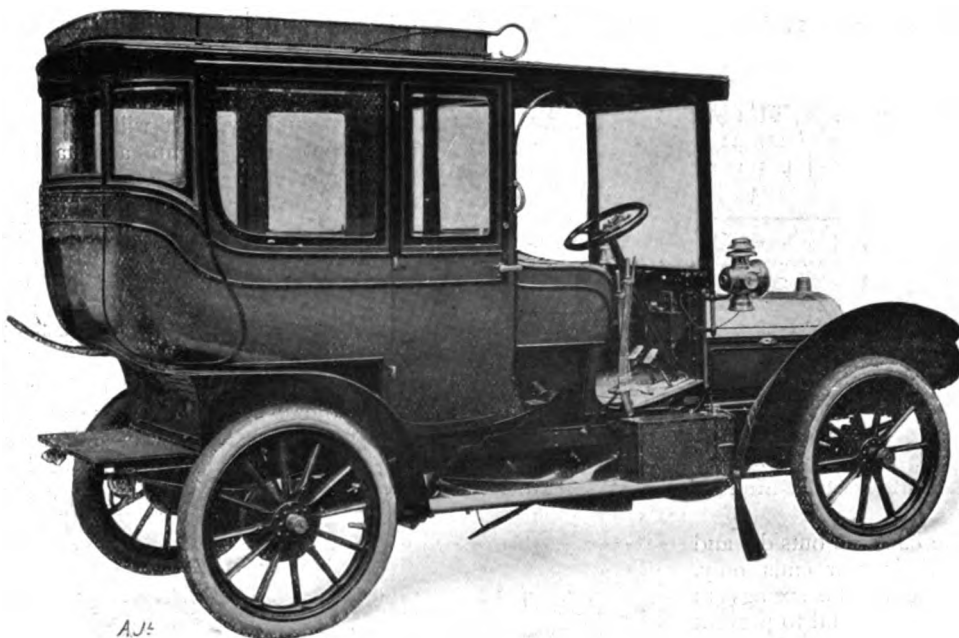
INDIA AND AUTOMOBILISM.

THE annual report of the Automobile Association of Bengal is an encouraging document for everyone interested in the promotion and development of the automobile movement in the great dependency. The activity of the Association during the past year and the commencement of this year have been sufficiently chronicled in our columns to enable our readers to form a good general idea of the work of this extremely energetic body in promoting the interests of the movement in the large districts which it represents. The antiquated 12-mile limit of speed which was fixed as the maximum pace for automobiles in the Province, would, but for the forcible representations made by the Association, have been complicated by further restrictive measures which would have had the effect of rendering automobilism practically impossible, and the fact that as the result of these representations sensible concessions were obtained from the Government authorities, is an excellent proof of the services which a club when really representing important interests can exercise even while it is comparatively young and inexperienced. In spite of the speed limit little friction exists in Bengal between automobilists and the police, partly no doubt owing to the easy good nature which characterises the native policeman. In fact, most other countries seem in this respect able to read Great Britain a lesson regarding what constitutes common-sense administration of a preventive statute. Before the formation of the Bengal Association, the restrictions in force in regard to the manipulation in commerce of petrol were very prohibitive, and as our readers will remember, the difficulties of procuring petrol

in India were, in consequence, in the early days of the movement, practically prohibitive. The Association has made its influence felt for good in this direction, and has secured from the Government relaxations by acting in concert with the leading firms in the trade, which now enable petrol to be obtained in such a way as to render the future development of automobile locomotion in the Province assured.

A subsidiary, but not less important feature of the Association's activity, has consisted in its propaganda as a roads improvement association. Though the main trunk roads of India are, as we have had occasion to point out, in general, excellent, the majority of those leading out of Calcutta were sadly in need of repair. In fact, the attempt to escape by motor car from Calcutta, has, up till recently, been almost invariably associated with broken axles, frames, or other minor troubles. Now, however, a very welcome improvement is being introduced, as a result of the Association's representations. The recent Reliability Trials in India brought to light the fact that on the main trunk roads, though, as mentioned above, they are in general excellent, considerable damage to tyres results from the large number of bullock shoes with which their surface is strewn. The Association have tackled this difficulty by offering rewards to scavengers and sweepers for picking up these tyre puncturers, and several thousands of cast shoes have in this way been collected. Possibly when this form of industry attains greater dimensions the value of the old iron may go some distance towards defraying the expenses of collection.

THE MÉTALLURGIQUE PETROL CARS.



A 24-30-h.p. Métallurgique Limousine. This handsome vehicle, which took First Prize at the Brussels Exhibition, has seating accommodation for seven persons.

AMONG those cars which were first introduced to the British public at the last Olympia Show were the Métallurgique vehicles, shown by the Institute of Chauffeurs, Limited. The Métallurgique cars are constructed in Brussels by the engineering firm of "La Métallurgique," and although, in general design, they follow the lines of a type which is quite orthodox, yet they have embodied details, such as a spring drive, variable-lift inlet-valves, and charging dynamo for the accumulators, which have not as yet come to be looked upon as usual.

The Métallurgique cars, which are of the live-axle type, are made in five different sizes, viz., 8-h.p., 12-h.p.,

16-h.p., 24-h.p., 30-h.p., but the 12-h.p. chassis is supplied with either a twin-cylinder or a four-cylinder engine. The 8-h.p. chassis has a twin-cylinder engine, and the 16-h.p., 24-h.p., and 30-h.p. engines all have four cylinders.

The 16-h.p. chassis, seen from the side in Fig. 1, is fitted with a 4-cylinder engine, has a gear-box of the sliding spur-wheel type, giving three speeds and a "reverse," with a direct drive on the top speed. The main frame is constructed of pressed steel, the side members have a tapering cross-section, and they are bent inwards in front of the dash in order to secure a wide steering lock. Semi-elliptic side springs support the

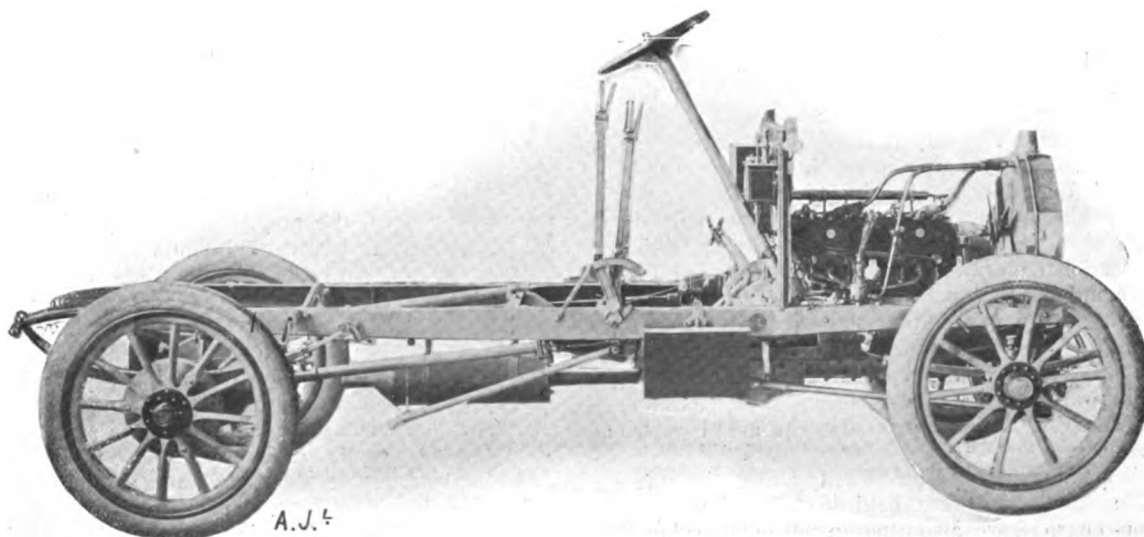


Fig. 1.—View, from the "off" side, of the 16-h.p. Métallurgique Chassis.

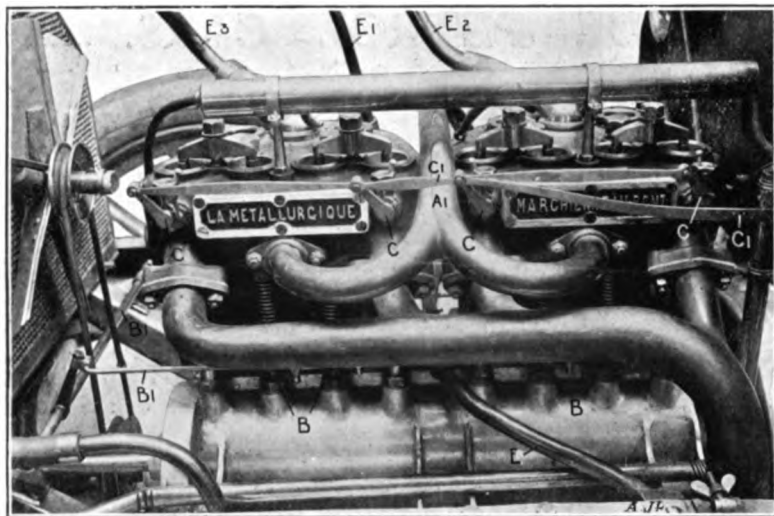


Fig. 2.—View of the 16-h.p. Métallurgique Engine, showing the half-compression cocks, C, and the variable-lift mechanism, B, for the inlet-valves.

frame; those at the back lie outside, and have shackles at their rear ends only. Top leaves are fitted to the springs in order to deaden the recoil and to prevent the lower leaves from separating too readily. The forks for the steering heads are forged solid with the front axle, which has an Σ section. The steering gear is of the worm and sector type, and the tie-bar between the steering heads lies in front of the axle. The transverse members of the frame are of channel section, and a channel underframe, which is carried between two of the transverse members, is provided for the engine and gear-box.

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The four-cylinder engine—seen from either side in Figs. 2 and 3—has its cylinders, of which the bore and stroke are 110 mm. and 95 mm. respectively, cast in pairs, and the valves all lie alongside one another so as to be operated by the same cam-shaft. The spur-wheels driving the cam-shaft are enclosed within the crank-chamber and are situated at the front end. Variable lift devices, B (Fig. 2), are fitted to the push-rods that actuate the inlet-valves, and these are operated, through a system of levers, B¹, by a hand-lever situated above the steering-wheel. The variable-lift mechanism consists of a right and left-hand screw, B, which is inserted in the push-rods. The arrangement of the various parts of this mechanism is clearly indicated in Fig. 4, which shows a sectional elevation through a push-rod and its guide. By moving the operating levers, B¹, the screw, B, is rocked about its axis, so that the effective length of the push-rod is either decreased or increased. In this way, the time at which the valve opens, the length of time during which it remains open, and the maximum height to which it is lifted from its seat, are all varied simultaneously.

Neat inspection covers are fitted above the interchangeable valves, and are held in place by yokes. Inspection-plugs, D, are also fitted in the cylinder heads to receive the high-tension ignition-plugs, which, however, are not shown in Figs. 2 and 3. The commutator

is mounted on the front end of the cam-shaft, which is extended so that the commutator lies under the radiator, and is accessible from the front. Petrol is fed by gravity from a tank situated under the driver's seat to the float-feed carburettor, which is of the "Sthenos" type; its peculiarity is, it will be remembered, the provision of an adjustable needle-valve inside the spray jet. The "mixture" passes from the mixing chamber, A (Fig. 3), through the induction-pipe, A¹, to the other side of the engine, where the pipe divides into two symmetrical branches of equal length, each of which is bolted to the inlet-valve chamber of its respective cylinder-casting. Only one inlet-valve-chamber is required for each cylinder-casting because the two inlet-valves are arranged between the two exhaust-valves. The cooling water is circulated by a centrifugal pump, which is friction-driven from the flywheel. The

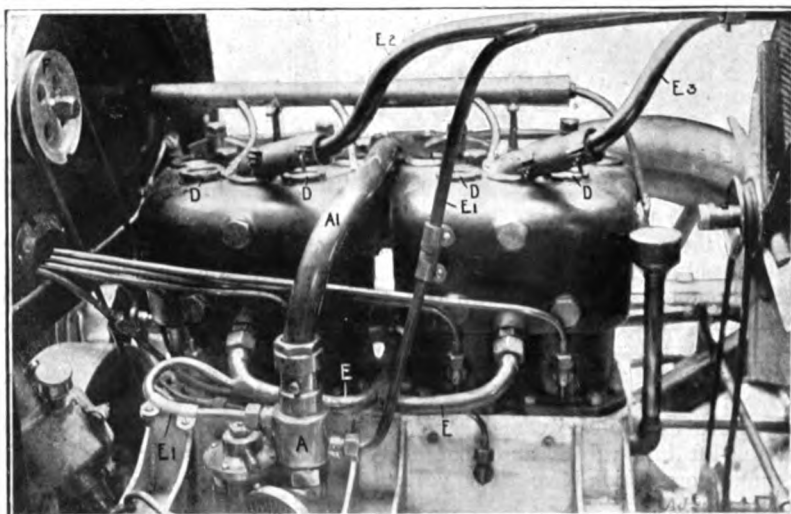


Fig. 3.—View of the 16-h.p. Métallurgique Engine, showing the "Sthenos" carburettor, A, and the screw fittings, D, for the high-tension ignition plugs.

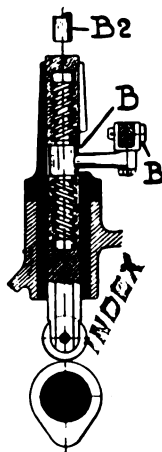


Fig. 4.—Sectional elevation through the variable-lift mechanism employed on the Métallurgique engine.

cold water enters the cylinder-castings by the pipe, E, from which a branch pipe, E¹, is led to the jacket surrounding the mixing-chamber, A, of the carburettor. Independent pipes, E² and E³, lead the hot water from above the cylinder-heads to the radiator, which is of the honeycomb type; a belt-driven fan is situated behind it.

In order to make it easier to start the engine by hand, half-compression cocks, C, are fitted to the sides of the cylinder-heads, and these are inter-connected, by a system of levers, C¹, with a handle on the dash. These half-compression cocks are also fitted with ball-valves, which are for the purpose of preventing

the egress of any flame; notches are cut in the seats against which balls are held by small springs, so that there is always

* Illustrated and described in THE AUTOMOTOR JOURNAL of January 31st, 1903 (p. 123).

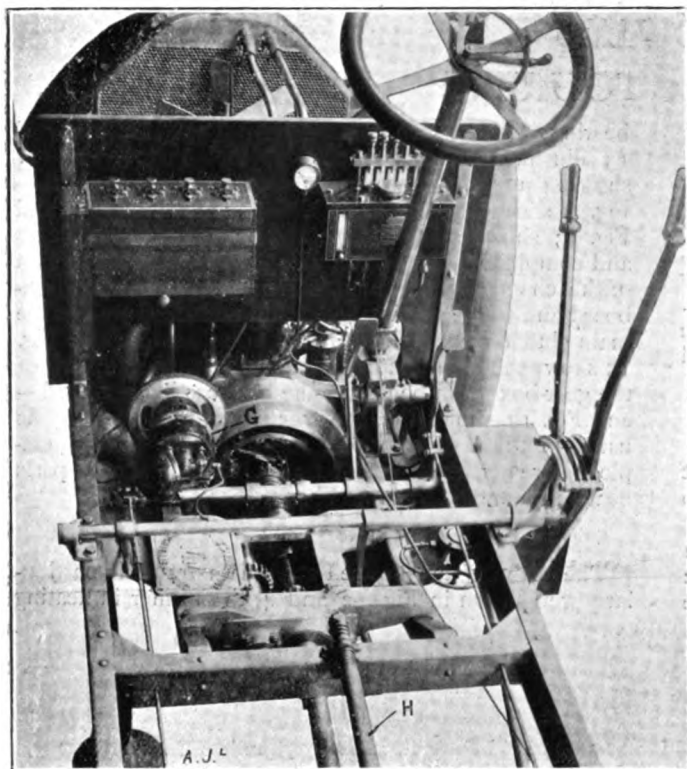


Fig. 5.—View of the 16-h.p. Métallurgique Chassis, showing the internal expanding clutch, the frictionally driven charging dynamo, G, and the spring-suspended torque-rod, H.

a passage for the gases when the cocks are open. The cocks have, as usual, cup-shaped orifices for the injection of paraffin, and small push-buttons are fitted so that the balls can be forced off their seats to allow the oil to run in more freely. The engine is controlled by two hand-levers above the steering-wheel, one of which is connected with the variable lift-device, and the other with the "timing" gear. No automatic governor is fitted to

the engine, but the "timing" lever is inter-connected with the clutch, so that the speed of the engine is automatically reduced when the clutch is disengaged. Lubrication is effected by a "Dubreulle" lubricator, which is driven by a belt passing over a pulley-wheel, F, on the front of the dash.

The clutch is of the internal-expanding type, and is operated by a sliding cone, as are the clutches on the Mercedes and Brooke cars. The clutch, together with the lever-arm that is operated by the sliding-cone, is visible in Fig. 5; the cover-plate has been removed in this illustration. Mounted alongside the flywheel is the charging dynamo, G; this is prominent in Fig. 5, where it is seen with the cover over its brush-gear open.

The gear-box is carried by the channel under-frame, and the gear-shafts are mounted on ball-bearings. Three speeds and a "reverse" are provided, the top speed being a direct drive from the engine to the live-axle. Universal joints are provided at both ends of the propeller shaft, which, at the rear end, is fitted with a "spring drive" device. The spring drive is arranged in the interior of a small drum, and merely consists of a large jaw-coupling, between the jaws of which are placed four helical compression springs. Two springs only are in action at a time, one pair for the "forward" and the other for the "reverse" direction.

The drive is transmitted from the axle to the frame through the rear spring only, but there is a spring-suspended rod, H, to take the torque of the axle-casing. The wheels are fixed direct to the live-axle, which runs in ball-bearings, and are shod with 810 mm. by 90 mm. Michelin tyres. Internal expanding brakes, compensated by a wire cable, and operated by hand, are fitted to the hubs, and a band-brake, operated by foot, is fitted about the shell containing the spring-drive mechanism. Both brakes are inter-connected with the clutch, so that the clutch is automatically disengaged when the brakes are applied.

A Useful Development.—Our readers who have doubtless followed Mr. Glidden's performances, "Encircling the World" week by week, in his Napier car, will recall that he ran a considerable distance upon various railroads in the United States, and on the Canadian Pacific Railroad in Canada, the ordinary wheels of his car being replaced by wheels with flanged tyres. The success of this experiment was so marked that the Canadian Pacific Railroad is now adopting a regular automobile service on the Sierra Railway, where, we understand, a number of automobiles are being specially fitted for the purpose. Anyone who desires to make use of this novel means of locomotion will be able to hire a railway automobile from the Company at the very reasonable rate of one full fare for the round trip, plus a moderate charge by the hour, and the actual expenses of the driver while in service. Perfect safety will be enjoyed, as the cars will be run by the regular train dispatchers, under the same conditions as ordinary trains or engines running down the line. It is very probable that there are many parts of the world where the new departure will be more or less generally adopted. In America and Canada, at any rate, there are many

stretches of railway where trains are very few and far between, while the high roads, as we have often pointed out, where not actually non-existent, are, in most places, such sloughs of despond as to discourage the most enthusiastic motorist. With the railway automobile, however, the difficulty will be largely overcome, and in good weather a delightful and almost ideal means of locomotion opened up over long stretches of country whose beauties could only previously be imperfectly enjoyed from the windows of railway trains.

To be hastening to the assistance of a man injured by a motor cycle accident on another machine of the same kind, and while on this errand of mercy to be run into by a railway wagon on a level crossing, is a particularly undeserved misfortune. This was what occurred to Dr. Brooks near Slough recently. It is a matter to which there ought to be a Board of Trade enquiry, for evidently if the motor cyclist could have got on to the rails, the gates at the crossing must have been open when they should have been shut.

THE LEGROS AND KNOWLES PETROL TOURING CAR.—PART II.

The Chief Dimensions.

THE chassis has a 9 ft. wheel base, with a 4 ft. 6 ins. track, and the artillery wheels, which have plain bearings, are fitted with 915 by 105 mm. pneumatic tyres. It weighs 20 cwt., and is geared to run at speeds of 9, 15, 24, and 32 miles per hour, respectively, on the four forward gears, when the engine is running at 800 revs. per min. The engine has cylinders of $4\frac{3}{4}$ -in. bore (120 mm. approximately), with a $4\frac{3}{4}$ -in. stroke, and develops 24-b.h.p. at about 900 revs. per min.

Our Illustrations.

The accompanying illustrations, which are for the most part reproduced from our own photographs, but also include line-drawings, enable all the more important characteristics of the vehicle to be seen. Apart from those showing the complete vehicle, they are as follows: Figs. 1 and 2 show the chassis from the "off" side

bearings to be seen separately. Figs. 11, 12, and 13 illustrate minor portions of the engine, Fig. 11 showing an inlet-valve—both complete and in parts—Fig. 12 showing a piston and a connecting-rod, and Fig. 13 showing the circulating pump—both in pieces and complete. Fig. 14 is a view of the central portion of the chassis, which enables the fittings on the dashboard and the regulating levers and pedals, as well as the main clutch and the main frame, to be seen, while Fig. 15 shows the inner clutch member. Fig. 16 is a view of the gear-box from beneath—the base casting removed—and Fig. 17 shows the construction of the brakes. As usual in these descriptions, the reference letters employed are arranged systematically, so that similar parts bear the same letters in all illustrations.

The Chassis.

The shape of the pressed steel main frame is particularly well shown in Figs. 2 and 4, the former indicating

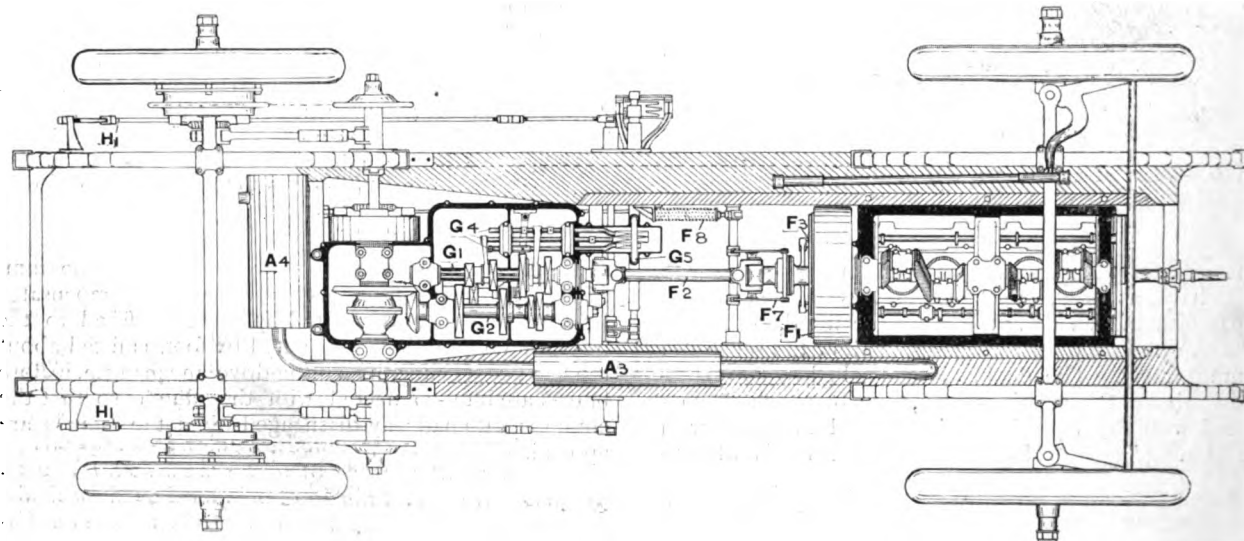


Fig. 3.—Plan, from beneath, showing the general arrangement of the mechanism on the Legros and Knowles Chassis, and demonstrating the accessibility of the various parts from underneath the car.

and from above respectively, but on this particular machine there are two small hand-levers on the steering-pillar, in lieu of the single lever control that is now substituted above the wheel. These views, taken in conjunction with Fig. 3—which is a plan from *beneath*—give a very complete idea of the general arrangement, and the general construction, of the various parts. Fig. 4 not only shows the construction of the steering-gear, but also demonstrates very clearly the peculiar cross-section that has been secured for the side members of the main-frame, for, in this illustration, the frame section is indicated by solid black lines. Fig. 5 is a view of the engine—from the off side—fixed in place in the chassis, with the carburettor, the fan, the wires, the water pipes, and the oil pipes fixed in position. Figs. 6, 7, 9, and 10 represent the engine (with the base of the crank-chamber removed) as seen from four entirely different points of view, and Fig. 8 enables the two cam-shafts complete with their

the way in which the lower flanges of the side members are carried inward to constitute an under-frame, and the latter showing the actual cross-section of one of the side members where it is so shaped. In Fig. 4, the portion, A, constitutes the main frame proper, the horizontal portion, A¹, forms a shelf upon which the engine is supported, and the projecting part, A², permits the dust-proof casing (below the engine) to be held in place by nuts that can readily be got at. It will be understood that the side members have this cross-section only in front of the gear-box, and that their cross-section gradually dies off to the usual Γ section behind. The two side members, which are quite straight, have a tapering section, and are specially shaped at each end for the springs to be attached direct to them. Both axles are solid forgings, the front axle having substantial steering-heads at each end, and, as already mentioned, the springs are fixed beneath, instead of above, both axles.

The engine lies in the usual position in front of the dashboard, with the radiator in front of it, but it should be pointed out that the chassis shown in Figs. 1 and 2 differs from the final design in that it has the dashboard further back than it will be fixed in future; more room is therefore available for the body than is there indi-

be noticed, too, that the whole of the gear-operating mechanism is enclosed inside the gear-box, that another rock-shaft—close behind that already referred to—is employed (in conjunction with a very neat compensating device) for operating the two hub-brakes, and that the foot-operated brake on the countershaft lies close up to the gear-box on the right side. Although the arrangement of the two pedals, and of the hand-brake mechanism, would enable either or both brakes to be interconnected with the clutch, yet this connection would only be made if specially insisted upon by a purchaser, for the makers do not believe in the expediency of connecting these controls together.

The Steering-Gear.

Referring to Fig. 4, the coarse-threaded screw, A⁶, is fixed to the base of the hollow steering-pillar, and it engages with the internally-threaded portion, A⁵. This "nut-portion," A⁵, is prevented from rotating, and is carried by guides that have large bearing surfaces inside the oil-retaining casing. It is, therefore, compelled to travel up and down, when the steering-wheel is turned, and, in so doing, it causes the shaft, A⁷, to rock about its axis, because the portion, A⁶, is connected with that shaft through the link, A⁸. A clear hole is, it will be noticed, drilled right through the link, A⁸, so that the rod, A⁹, is free to move up and

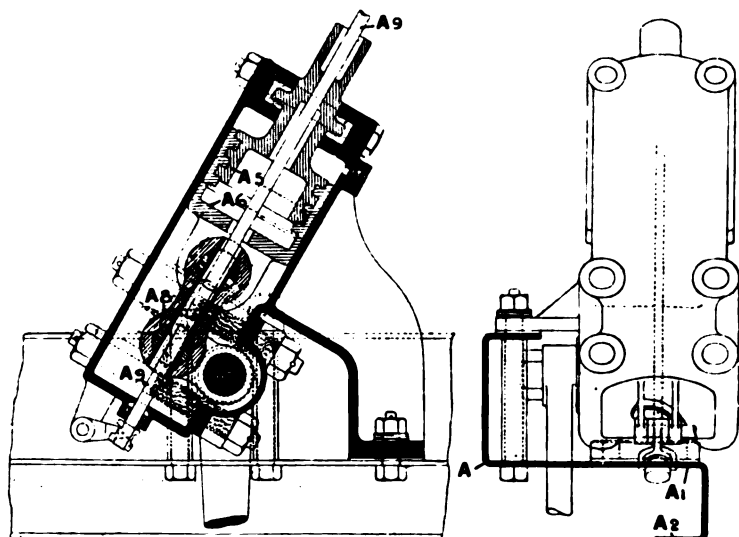


Fig. 4.—The 24-h.p. Legros and Knowles Car. Longitudinal vertical section through the steering-gear; also front elevation, with cross-section of one side-member of the main-frame.

cated, and the bonnet is reduced in size. The gear-box is, it will be noticed, secured by two bolts at its rear end to one of the cross-members of the frame, while at its front end it is slung by a central bolt, that has a knuckle-joint, to another cross-member. Jaw-couplings are introduced in both halves of the differential countershaft, the extreme ends of which are mounted in long plain bearings that are bolted to the frame. Our illustrations also show that there is a light metal casing extending back from beneath the engine almost to the gear-box, and that—in addition to the final exhaust-box, A³, which is placed transversely behind the gear-box—there is another expansion-chamber, A⁴, introduced into the exhaust-pipe. A gravity feed is employed for the fuel, and the petrol-tank is fixed beneath the front seat of the body, while the regulating levers and pedals are arranged in much the usual way, and therefore do not need any special mention.

Before leaving our general consideration of the chassis, as a whole, it might be as well to point out that the gear-lever is arranged as on the Mercedes cars, so that it can be moved sideways into either of three alternative slots, and that the sleeve to which it is fixed rides outside the rock-shaft that carries the brake-lever. It will

down at all times, for controlling the power and speed of the engine; this rod is, at its upper end, connected with the hand-lever above the wheel, and its lower end is connected both with the throttle-valve and with the "timing-gear" for the low-tension ignition system.

(To be continued.)

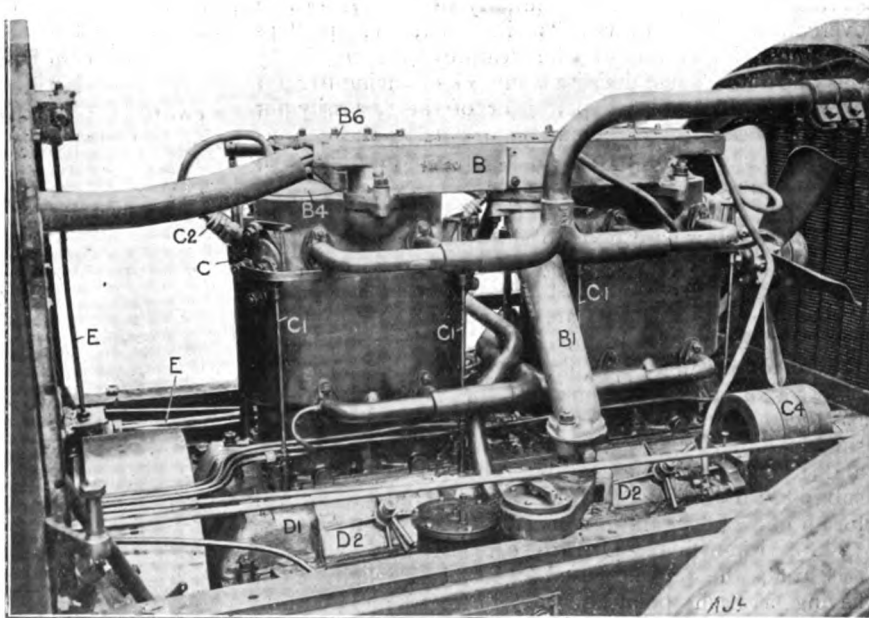
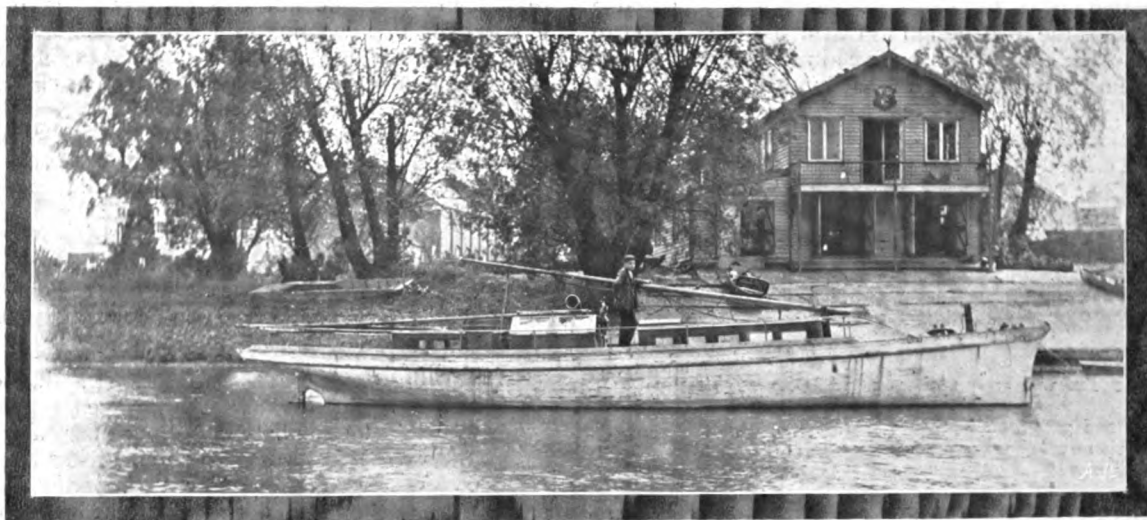


Fig. 5.—View of the 24-h.p. Engine, fixed in place in the Legros and Knowles Chassis, as seen from the "off" side.

THE BRYANT-WATLING "HEAVY OIL" CARBURETTOR.

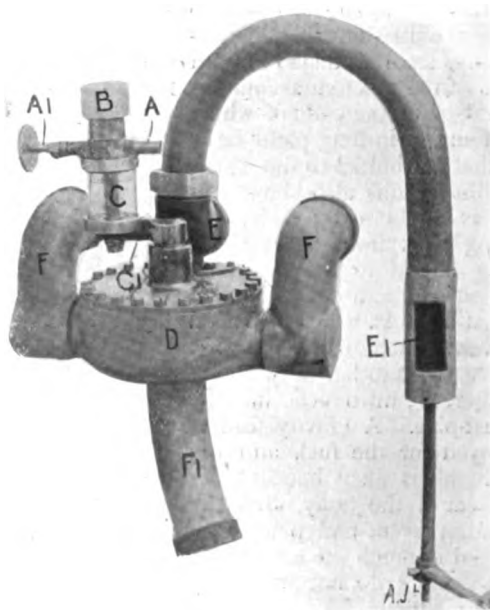


The Wolf—a 48-ft. boat, the single-cylinder engine on which is fitted with the Bryant-Watling "heavy oil" carburettor.

VERY interesting, and in many ways novel, is the Bryant-Watling "Heavy Oil" Carburettor, which has been designed for enabling ordinary paraffin oil to be used as fuel in internal combustion engines. One of the principal drawbacks to heavy oil carburettors, as hitherto constructed, has been, as our readers are aware, that they require the use of petrol, or else the application of external heat, to enable the engine to be successfully started when cold. That the Bryant-Watling device overcomes these drawbacks is, therefore, perhaps the most important of the features possessed by this apparatus, since the disadvantages of having to carry even a small supply of petrol, or of the necessity for applying heat, as a preliminary to starting the engine, are such as to handicap any carburettor or vaporiser that requires these additional provisions.

The Bryant-Watling carburettor, the external appearance of which we are able to show by the photographs, which we have been able to obtain through the courtesy of the inventors, is quite distinct as a type, although it embodies features that are common both to those devices which are solely pulverisers (like the "Sutton"*) and to those which are (like the "Wolseley"†) essentially vaporisers. For some time past, this carburettor has been used on the Wolf, a 48-ft. boat, which has a single-cylinder engine of 4-in. bore and 6-in. stroke; and it was one of these carburettors which was recently submitted by Mr. Bernard Redwood to the A.C.G.B.I., for an official test, and underwent a 500-mile trial, on a 12-h.p. twin-cylinder Darracq car last week. During this trial, the engine used "Royal Daylight" oil, having a flash point of 78 degrees, and costing 4d. per gallon. The observations published by the club go to show that the carburettor did what was claimed for it in the matter of enabling the engine to start cold, but that there was a considerable emission of smoke while the engine was running light—this disappearing so soon as full load was put on—and that the engine appeared to be incapable of developing its

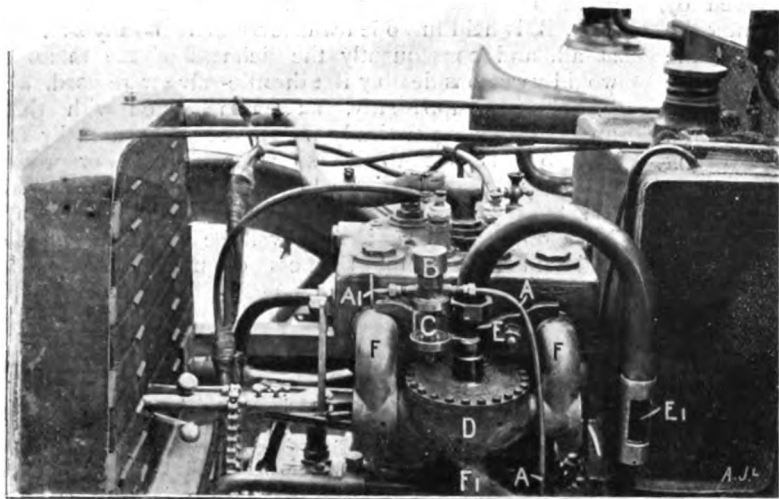
full power until the carburettor had become sufficiently warmed by the exhaust. The trouble of obtaining a clean exhaust is, as everyone knows, not the least of the numerous disadvantages against which experimenters in the use of heavy oil have had to contend, although it is apparently considered by them as a secondary consideration—to be overcome when the carburettor is otherwise perfect. As regards the absence of available power immediately after starting, this is but to be expected from the very nature of the apparatus, which—as will be explained presently—allows the



The Bryant-Watling "heavy oil" carburettor, showing the glass tube, C, the pulverising passage, C', and the heating chamber, D, through which the oil from the pipe, A, passes on its way to the induction pipe, E. Air is admitted at B and E', while the exhaust gases issue through the pipes, F and F'.

* For illustrated description, see THE AUTOMOTOR JOURNAL of June 4th, 1904.

† For illustrated description, see THE AUTOMOTOR JOURNAL of April 22nd last.



View of the Bryant-Watling "heavy oil" carburettor fitted to the twin-cylinder engine of the trial car.

engine to draw in but a small proportion of its full charge, until such time as the carburettor is in a fit condition for normal running.

Our illustrations show the yacht *Wolf*, on which we have had an opportunity of observing the successful behaviour of the carburettor, and also views of the engine in place on the trial car, as well as a view of the carburettor separately.

The paraffin, which may be fed from the tank by gravity or by pressure, is led through a pipe, A, to an inverted jet situated immediately above the glass chamber, C. The effective bore of the orifice through which the oil reaches this jet, is regulated by the needle-valve, A', which is, however, "set" once and for all as regards an individual engine, and for any particular grade of fuel. Normally, the paraffin is prevented from flowing from the jet by the action of a spring-loaded needle-valve which is contained inside the glass chamber, C, but this valve has a diaphragm attached to it so that the valve is held off its seat during the suction-strokes of the engine.

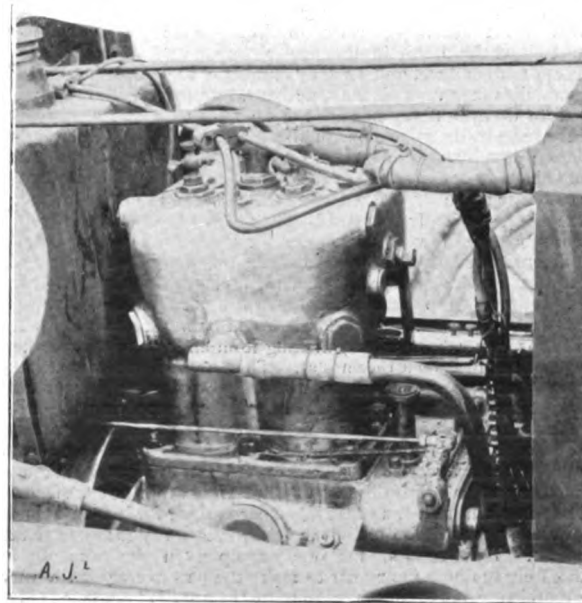
Only a small quantity of air is allowed to enter above the jet, through the loose-fitting cap, B, and this air is all that is admitted to the engine at the time of starting. The oil and the air become intimately mixed together during their passage from the chamber, C, to another chamber, D; this portion, C', of the apparatus having a special internal construction that has been found to minutely pulverise the liquid oil as it passes through it. The mixture then enters the chamber, D, at the centre, and is led through a tortuous passage of spiral form, before it is allowed to enter the short induction-pipe, E, through a small nozzle that projects into that pipe.

The bulk of the air required by the engine is drawn direct through the induction-pipe, from the atmosphere, when the engine is running normally, but this air supply can be regulated (from zero to the maximum) by the hand-controlled valve, E'. The valve, E', provides the sole means for regulating the richness of the mixture, and it serves no other duty, for the power of the engine is subject only to the control of a variable-lift device fitted to the inlet-valve. When first starting the engine from cold, the valve, E', has to be closed, so that then the whole suction of the engine shall be concentrated on

the carburettor, and the air shall be drawn through it at an extremely high velocity, although the crank-shaft is only being rotated very slowly. The high velocity of the air, rushing through the spraying device, pulverises the oil and forms an extremely rich, though comparatively small quantity of, explosive mixture. Being so highly enriched when it issues into the chamber, D, it can afford to lose a considerable portion of its oil charge as it encounters the cold surfaces over which it passes before being ignited in the cylinder. Our own idea is that the action of the spiral path traversed by the mixture inside the chamber, D, is, at this time, to receive the less perfectly atomised oil on its cold surfaces, and to thus prevent any liquid oil from finding its way into the cylinder. Centrifugal force would tend to separate any free oil from the air, and whereas it might well prove troublesome inside the working cylinders, it can do but little harm in the temporarily cool chamber, D, or even in the induction

pipe. At starting, therefore, a sufficient, though somewhat small, charge of suitably rich mixture is available for the engine, and consequently no greater difficulty is experienced in getting it under way, than with a petrol engine, although the amount of power that it is then capable of developing is naturally very limited.

As soon as the engine commences working, the conditions are entirely changed, for, in the first place, the increased engine speed raises the velocity of the air passing through the carburettor, and it also tends to reduce the quantity of mixture available for each charge; but, most important of all, the chamber, D, becomes heated by the exhaust gases, and so tends to render the mixture richer, by enabling the whole of the sprayed oil to be held properly in suspense in the air. Both effects permit, and demand,



Another view of the 12-h.p. Darracq engine on the trial car. The carburettor, being on the other side of the engine, is not visible in this view.

the admission of auxiliary air through the valve, E¹, and thus the available power can be gradually increased by allowing larger and larger explosive charges to enter the cylinders during each suction stroke. The whole of the exhaust gases from both cylinders are led through a large jacket formed in the base of the chamber, D, but this jacket—which is entirely divided off from the spiral passage—has no internal obstructions or baffles of any kind, and does not therefore interfere with their free flow from the pipes, F, to the common exhaust-pipe, F¹.

It will be realised that the very nature of this ingenious carburettor renders the employment of variable-lift inlet-

valves preferable to a throttle-valve for controlling the power of the engine, for the fuel valve inside the glass tube, B, is held full open whenever there is any suction at all, and consequently the richness of the mixture would vary considerably if a throttle-valve were used.

Although, apparently, an engine fitted with this apparatus emits practically no smoke when actually in use, but is apt to do so when starting, or when suddenly throwing off the load, it must be remembered that the regulation of the carburettor is now effected by hand only, and that it may well be found feasible to maintain a constant richness of mixture automatically.

INDEX CARBURETTORS.*

(Continued from page 568.)

By Mervyn O'Gorman.

WE must not allow such a trifle as that to baffle us, and we may be able to arrange that the access of liquid to the spray shall be somewhat more closed by a small temperature valve when the liquid is hot than when it is cold. On the other hand, when the air is hot, a somewhat less quantity of petrol will be required per stroke, because for each degree absolute by which the air is hotter we shall require $\frac{1}{3}$ times less petrol, and it is not at all absurd to suppose that the air will vary by as much as 50° C. on any one day, or 70° C. between an extreme winter and an extreme summer condition. So we will require that this little thermometer valve controlling the liquid shall be opened by the difference in pull due to two thermometers, one of which is in the air duct and one in the petrol duct.

Merely for the sake of making the matter concrete, I will suppose that a tapered needle is thrust down the jet to choke it by a flat spring in the air path, made of zinc and copper so turned that as the copper expands more than the zinc with rising temperature, the needle will be pushed lower down. The amount of aperture must

be calibrated according to the air-temperature law $\frac{P.V}{T} = K$. The corresponding spring which is immersed in the petrol opens a separate petrol-valve, and must be calibrated according to a curve of flow and temperatures like that given by Mr. Sorel. This curve of temperature is unfortunately not the same for all petrols. Mr. Sorel has shown that denser petrols do not vary so much with temperature.

If we are still driving at perfection in this direction it still remains to us to heat the petrol in the float-chamber and spray tube to a constant temperature, and thereby eliminate the necessity for this second adjustment. This may, perhaps, turn out to be considerably easier to do even if we heated the petrol by an exhaust by-pass. All we have to do is to control the amount of hot water or hot exhaust gases by a thermostat. I should prefer using water rather than exhaust gases, because of the diminished chances of getting the thermostatic valve choked with impurities such as soot.

Heating.—It is Mr. Dugald Clerk who has shown that the colder the mixture we draw in the better for the possible output of the engine, provided that as we evaporate the petrol we supply the latent heat for the purpose. The amount of heat required is, therefore, proportional to the amount of petrol used. As the mixture is not always of constant proportion it would be best to heat the petrol itself as it leaves the nozzle by making it impinge on a hot cone kept at a constant heat by a thermostat. This method does not exist at present, but approximations to it exist by warming the mixture chamber into which the petrol passes, and thus supplying the extra heat for which larger quantities of mixture are used by heating a portion of the air. The objection to this plan of passing a proportion of the air over a hot pipe is that when the gas is taken in slowly, say at half throttle, it gets more heated than when the same volume is taken in fast, so that if the car is right for hill-climbing it is probably wrong for racing at full power on a more moderate gradient. This results, for one example, in the necessity for elaborately tuning a racing car to make the best average on a varying road instead of tuning the carburettor in a skilled manner to give,

not the best average, but the actual best possible result at each and every section, hilly or flat.

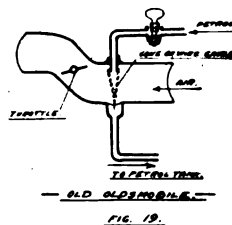
I am afraid you will feel disposed to protest against my introducing three thermostats in a car to be supplied with air which in ordinary course will be at various temperatures. My reply is that I am not so sure we shall not yet even introduce a fourth thermostat into the air supply, but I am fairly hopeful some such course will yet be adopted when we consider that little weight is added by these devices, and that one minute gained in a six-hour race is quite a respectable victory, bringing a business worth tens of thousands of pounds.

The Spray Nozzle.—The function of this is to minutely subdivide the issuing liquid so that a very large surface is offered to the air for rapid evaporation. Each cylinder full of gas required a little cube of petrol having about $\frac{1}{4}$ inch to the side, and this may be shot out of a single or many orifices, and as the evaporation takes place from the moment the liquid leaves the nozzle, it is disposed to abstract all the heat it can get, not only from the air but also from the metal nozzle itself, thus lowering its temperature considerably. For this reason, if it be at all possible to do so, the water heating should be brought as near as possible to the nozzle.

Mr. Perissé points out that if nozzles are designed to produce a high jet (which means that they do not impede the flow of liquid), and are, therefore, efficient as regards the output, for a given pressure has the defect that the jet so produced remains compact, and will not be easily broken up into a cloud of droplets. Capillary tubes, on the other hand, though giving a good "cloud effect," introduce a high resistance which makes a difficulty in starting the carburettor, a matter of no small importance, now that we are getting to use cars which almost invariably start on the switch.

The Longuemare type of nozzle avoids the difficulty of drilling a fine hole accurate to 1 in 10,000th of an inch (which cannot be altered or amended) by substituting for this the making of scratchings inside a conical cup which is fitted with a male piece, giving the effect of a rose, and allowing a little adjustment of the size and number of holes used. The control of the liquid after it leaves the nozzle has been most elaborately dealt with, and various methods are indicated in the examples of carburetors which I have given. I do not think I shall be understating the case if I claim that the difficulties in properly dealing with the fluids after this point are at least as great as the sum of all the difficulties met with up to here.

I should like to put forward the somewhat paradoxical suggestion that, much as we may pride ourselves in England on having stood together to fight the alleged master pattern of Maybach's float-feed carburettor, it might have been better for us if we had never won. For, supposing one half the ingenuity that has since been expended on float-feed spray devices had been turned into other channels, the riddle might have been solved elsewhere in a simpler fashion; witness the excellent beginnings made by surface (Fig. 19) and wick carburetors of the most amazing simplicity of design. As I have said, the physical difficulty



in the way of persuading a liquid and a gas to follow even remotely similar laws over a very wide range of two variables, namely, the pressure and the duration of that pressure is immense. If both the substances concerned were presented in the gaseous form they would appear *a priori* to be easier to deal with as obeying by their nature identical laws as to the relations between volume, pressure, and temperature, and similar laws as regards their flow through pipes and inertia.

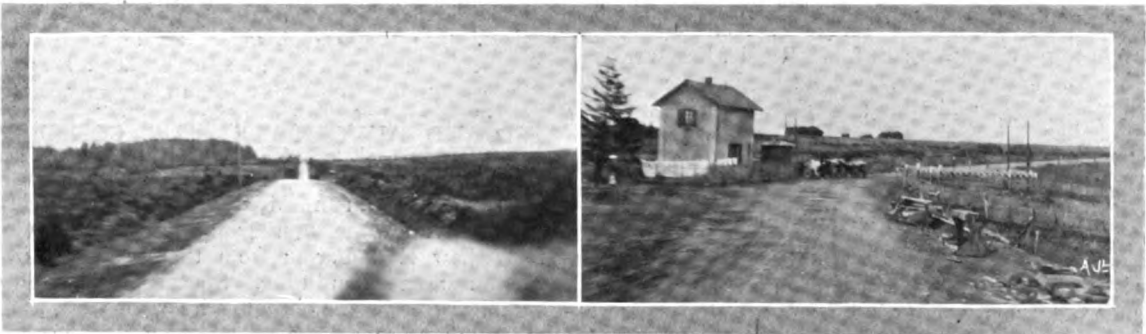
* Excerpt of a Paper read before the Automobile and Cycle Engineers Institute, on Thursday, the 13th April.

RACES, RECORDS, AND TRIALS.



A sample of some of the corners. The course is the turning to the right, not straight on.

Another bad turning, taken from the tonneau of a car, looking back on the corner.



The only really straight stretch on the course, about 4 kilometres. The surface of this road is at present very bad.

An easy level crossing.



A village street. Just round the corner is the worst turning of the entire circuit.

The road leading into Clermont Ferrand, which it is claimed should be either neutralised or cars divided by time intervals.

GORDON-BENNETT CUP RACE.—The Auvergne Circuit. From photos by Mr. H. Austin.

GORDON-BENNETT CUP RACE.

Opinions continue to be expressed in regard to the nature of the course. Mr. Austin, of the Wolseley Company, has recently returned from a trial run round the circuit, during which he was able to secure some excellent snap-shots from his car whilst running at a good rate of speed, some of which we this week reproduce. Speaking generally, Mr. Austin's impression of

the course is that there are many very dangerous turnings which make it more severe even than the Taunus course of last year. There are only a very few stretches of road on which a car can be safely let out on top speed, and the trial is likely to prove, he thinks, a very severe test of the drivers' endurance and skill. Some of the leading features of the course are noticeable in Mr. Austin's photographs, which we reproduce.

M. Rigoly also considers the circuit not only a severe one but an intensely dangerous one. In traversing the course he has counted no less than 145 *bad* turnings. In this number he does not include mere windings, but literally sharp-angled turns. High average speed is, he considers, entirely out of the question, and the race will resolve itself into a test for differentials, brakes, and above all pneumatic tyres. Between Bourglastic and Pontamur he considers arrangements ought to be made for ensuring an interval between the starting of each competitor on this section, as from the nature of the narrow road it would be practically impossible for two racing cars to pass each other safely at full speed, a result which would obviously be most unfair to any of the cars which happened to be travelling at their best. As he justly remarks, it could hardly be expected that any racing car should slacken speed and thereby risk a possibility of losing his place to enable a competitor to pass, however fast the other car might prove to be. The nearness of the date of the Eliminating Trials, he contends, is against any adequate alteration in the road, and, therefore, the only alternative is to enforce a time interval upon each competitor which would affect all alike.

The contrary view to that of M. Rigoly, however, is taken by M. Touloubre, who would prefer to see no neutralisation whatever, letting each man do his best and take all chances.

A Wolseley car, No. 11 in the British Eliminating Trials, it has now been arranged shall be driven by the Hon. C. S. Rolls.

Persistent rumours are current on the Continent that Queen Margherita of Italy intends to motor to the Auvergne Circuit to witness the Gordon-Bennett Race.

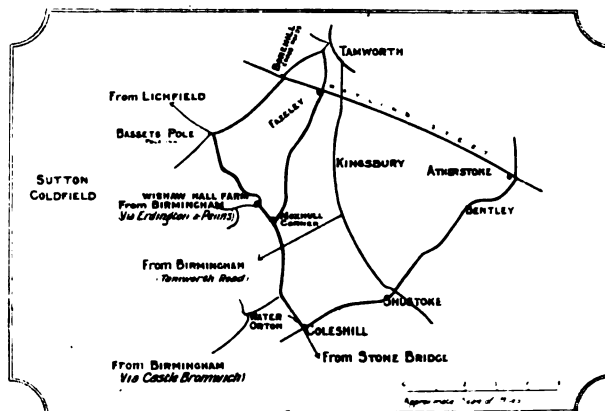
The Grand Stand to be erected at Laschamps will accommodate 4,000 persons. Members of the A. C. de France will have free admission, whilst, in certain parts, the public will be admitted at 20 francs per seat.

The military authorities are placing 7,500 men at the disposal of the A.C. de France for the purpose of keeping the course. In addition, 1,200 gendarmes will be employed.

The dispute connected with the Swiss entry does not appear as yet to be any nearer solution. The Swiss Club claim that they learned from a representative of Messrs. Dufaux that they did not intend to start in the race, but Messrs. Dufaux entirely repudiate any such communication having been sent to their knowledge, and they therefore claim the right, having had their entries accepted, of starting in the race on behalf of Switzerland. Further developments of the situation will therefore be watched with interest.

The selection of the Aix-les Bains Circuit, for next year's French Eliminating Trials, has been now practically settled officially. As we announced a long time ago, this was to be arranged by way of compensation for the suppression of the big racing event which at one time it was hoped was to take place on the Aix Circuit this year.

Fuel Consumption Trial.—To-day, Saturday, the Consumption Trial organised by the Midland Automobile Club takes place near Birmingham. The start is at Wishaw Hall Farm, about eleven miles from that city, close to the main road between Coleshill and Lichfield. The competition is for touring cars, which must be entered and driven by club members in the trials. We give an outline map of the roads over which this test takes place, the course being, after leaving Wishaw Hall Farm, Bonehill Cross Roads, Fazeley, Moxhull Corner, Basset's Pole, where turn round and retrace journey *via*



MIDLAND AUTOMOBILE CLUB CONSUMPTION TRIALS.—Sketch plan of the route of the Trial.

Wishaw Hall Farm and Moxhull Corner to Fazeley, from there to Atherstone, Bentley and Shustoke to Coleshill, to Wishaw Hall Farm; from there proceed over the whole route a second time. Special motor spirit will be supplied free by the club to all competitors, and tanks must only be replenished at Wishaw Hall Farm. Each car must complete the course in $9\frac{1}{2}$ hours, inclusive of all stops. There will be three medals, and the formula on which the prizes will be given is—

$$\frac{\text{weight of car and load}}{\text{quantity of spirit consumed}}$$



THE AUVERGNE CIRCUIT.—The starting point at Laschamp. The starting line is at the sixth tree on the left, which is slightly tinged with white and marked by a cross.

Irish Motor Meet and Hill-Climb.—The members of the North of Ireland Yacht Club arranged a motor meet and hill-climb amongst the motorists belonging to that body. The meet took place on Saturday last at Cultra, and was of a most successful nature. Over 35 cars entered the enclosure, 29 taking part in the hill-climb. The committee in charge of the arrangements in connection therewith carried out their work in a most satisfactory manner, and much credit is due to the kindness of R. J. Kennedy, Esq., C.M.G., D.L., who placed his well-known and beautifully-situated place at Cultra at the disposal of the committee, with the result that the venue was all that could be desired. The contest was divided into three classes: Class 1 for cars of 15-h.p. and over; Class 2, cars over 10-h.p. but not exceeding 15-h.p.; and Class 3, cars under 10-h.p. The following members of the club had charge of the arrangements:—Messrs. C. H. Craig, W. D. Donnan, M.D., C. W. Henderson, W. Hume, W. M. Inglis, with R. E. Workman, hon. sec. The following are the chief results:—

CLASS I.—Cars over 15-h.p.

		m.	s.	
Mr. Grenville Craig	... 18-h.p. Daimler	1	19	1
Mr. George Combe	... 15-h.p. Darracq	1	29	2
Mr. C. Henderson	... 15-h.p. Darracq	1	37½	3

CLASS II.—Cars over 10, but under 15-h.p.

Mr. R. E. Workman	.. 14-h.p. Minerva	1	17½	1
Mr. W. M. Inglis	.. 12-h.p. Clement	1	48½	2
Mr. R. Workman	.. 12-h.p. Darracq	1	56	3

CLASS III.—Under 10-h.p.

Mr. A. F. Craig	... 5-h.p. Oldsmobile	1	54½	1
Mr. L. Ewart	... 7-h.p. Humber	1	53½	2
Dr. Doonan	... 8-h.p. Darracq	2	20	3

Paul Meyan Challenge.—We recorded last week the acceptance, in its entirety, of M. Meyan's challenge by Mr. Siddeley with a Siddeley car, and we shall therefore hope to see this sporting match successfully concluded in favour of Great Britain during the latter part of July. Mr. Siddeley having taken up the challenge, Mr. Edge will have to forego the honour of representing Great Britain, as no doubt M. Meyan will find quite sufficient to overcome in Mr. Siddeley's all-British car.

BEXHILL Motor Meeting is to take place on Wednesday, June 14th.

AFTER June 1st next it has been determined by the A.C.G.B.I. that no one can be entered on the Competitor's Register unless he holds a driving certificate of the club.

In the report of the Consumption Trial of the Herts A. C., the results as officially supplied in regard to Mr. Edge's 15-h.p. Napier car appear to have been wrongly given. The consumption per ton mile should have been '0243 gallon instead of '00243.

THE Tourist Commission of the A.C. de France, at their meeting last week, decided to do away with official observers travelling on cars in tourist vehicle contests—from an English point of view a remarkable decision.

THE SCOTTISH RELIABILITY TRIALS.

Glasgow—Tuesday night.

THE cars to take part in this contest were produced to the Scottish Western Section at the garage of Messrs. Rennie and Prosser in North Wallace Street to-day. Of the forty-four cars entered, only one, the Beaufort, failed to materialise, so that forty-three cars will start on the journey to-morrow forenoon. As the English technical Press has hitherto shown no great desire to squander space in a prodigal fashion on this contest, it may not be out of place to mention one or two points in connection with it now. One point of importance is that the trial is beyond doubt the most severe ever attempted under observation in this country, and it need surprise no one if some of the cars entirely fail to get through. The first day's run for cars of ordinary power has a good deal of the character of a picnic, but thereafter it will be no holiday for the drivers, and without doubt a severe test of the small cars, and of those improperly geared. For instance, in the first hill-climb during the second day, there is a turn known as the Devil's Elbow, where the road is so narrow and the turn so short that it will have to be negotiated by cars with a long wheel base, as if they were turning, and this on a hill of about 1 in 8 to 1 in 6½. Thereafter there will be plenty of use for both gear-changing and brake levers, and, especially after getting into the Highlands on the third day, hard work will be the order of the day. On the first hill-climb no second car can start until the first has been signalled from the top, but on the second hill-climb at Aberfeldy the road is wide enough to permit of two cars passing, and it has, therefore, been decided to allow the cars to follow at brief intervals.

Let us recapitulate the character of the course. Leaving Glasgow to-morrow, the route is through the Black country of Scotland, Coatbridge, Airdrie, Bath-



THE AUVERGNE CIRCUIT.—Inspecting the course. Duray, who will drive a De Dietrich in the Eliminating Trials, and his mechanic, in front; Mr. Alexander Burton, who will steer a Mercedes on behalf of Austria, in the tonneau.

gate, &c., to Edinburgh, then back the same side of the Forth, to Stirling and on to Perth, then down Tay Valley to Dundee, where the night is to be passed. Next day the route is north-west into the Grampians, past one of the old hostleries or spitals on the threshold of the Highlands in Glenshee. It is about this time that the fun begins, and the man who has failed to appreciate the fact that some discretion in gearing his car is necessary, will find himself left, for what saith the rules: "No sprockets shall be changed during the trial under any condition." Once over the shoulder of Cairnwell, the car is safe till well into the next day, but although the road towards Aberdeen is mostly downhill, it is no leisure time for the driver. The first genuine entrance into the Highlands takes place after leaving Keith on the third day (Friday), and thereafter till Glasgow is reached there is no rest for the driver, however weary. The route, after reaching Grantown, Strathspey (in the heart of the Scottish distillery district), follows the course of the Highland Railway to Pitlochry, where the third night is spent, the second having been passed in Aberdeen. The last day is by Aberfeldy, on to Loch Earn *via* Crieff, over into Glen Dochart, following the Callander and Oban Railway to Dalmally, then over to Inverary on Loch Fyne, to Arrochar on Loch Long, Tarbet on Loch Lomond, and back to Glasgow.

This evening a most interesting meeting of owners, drivers, observers, and club officials was held in St. Enoch Square Hotel, Glasgow, where Mr. Adam, the chairman of the Western Section, laid down the law and appealed for considerate driving. Questions were invited, and a number of drivers and others took advantage of the opportunity to have matters cleared up.

The weather here is dull at present, but cannot be considered any presage of the weather to be expected, as the greater part of the route is over some of the driest country in the United Kingdom, while Glasgow is more moist than most. The cars to start are: 8-h.p. De Dion, 12-h.p. De Dion, 9-h.p. Cadillac, 8-h.p. Darracq, 12-h.p. Darracq, 15-h.p. Darracq, 6-h.p. Wolseley, 14-h.p. Wolseley, 16-h.p. Albion, 12-h.p. Arrol-Johnston, 10-h.p. Argyll, 18-h.p. Argyll, 16-h.p. Argyll, 12-h.p. Argyll, 12-h.p. Clement, 16-h.p. Clement, 10-h.p. Ford, 20-h.p. Ford, 12-h.p. Gladiator, 16-h.p. Gladiator, another 12-h.p. Gladiator, 16-h.p. Beeston Humber, 8-h.p. Coventry Humber, 18-h.p. Chenard and Walcker, 12-h.p. Sunbeam,



Callous Brutality.—So much fuss has been made about the alleged lack of consideration for other road users, especially dogs, displayed by certain drivers of motor cars, that the presumption has almost grown up in the minds of many people that every driver of a horse-propelled vehicle is of necessity a careful and courteous gentleman, and, above all, considerate in the extreme to the least of God's creatures. People who have much reason to be frequently on our high roads know how fallacious this view is, and how wanting in thoughtfulness and consideration the average drivers of hippomobiles are as compared with automobilists. A very scandalous example of this total want of ordinary feeling on the part of a driver and occupants of a horse-drawn victoria has been brought to our attention by Mr. Mark Mayhew. At a quarter to one on Monday morning last, a vehicle of this kind, containing two ladies (?), was proceeding along the Chelsea Embankment, and it was deliberately

18-h.p. Siddeley, 20-h.p. Ariel, 24-h.p. Mors, 14-h.p. Minerva, 12-h.p. Swift, 30-h.p. Daimler, 24-h.p. Germain, 24-h.p. Thornycroft, 12-h.p. Pipe, 12-h.p. Richard-Brasier, 24-h.p. Ryknield, 20-h.p. Drummond, 30-h.p. Belsize, 15-h.p. Brooke, 7-h.p. Vauxhall, 30-h.p. Martini, 20-h.p. Vinot et Deguingand, and 12-h.p. St. Vincent.

More next week.

A. F. S.

WITH reference to the 100-guinea Cup offered by the Continental Tyre Company, to the winner of the International Tourist Trophy, provided his car is fitted with Continental tyres, this we learn is being designed and will be made by Elkington and Co. The Continental Company have arranged to have an engraving of the winning car made on one side of the cup, which should lend an additional interest to their award.

Florio Cup.—A modification has been made in regard to entries for this important Italian competition, which takes place in September on the Brescia-Mantua Circuit. It has been decided that each make of car shall be represented by a maximum of four vehicles only, as the nature of the circuit, which is 160 kiloms., would render too large a number of competitors (it is considered) dangerous. The committee also further reserve to themselves the right to again reduce this number in the event of it being deemed necessary owing to the number of entries received.

Modifications in the route selected for the Cup are under consideration.

Vanderbilt Cup.—In addition to those announced last week as having entered for the French Selection Trials for this cup, Renault Frères have now entered three cars, bringing the total up to twelve.

A 120-h.p. Mercedes car, belonging to Mr. Robert Graves, of New York, has been entered for this race, through the German Automobile Club.

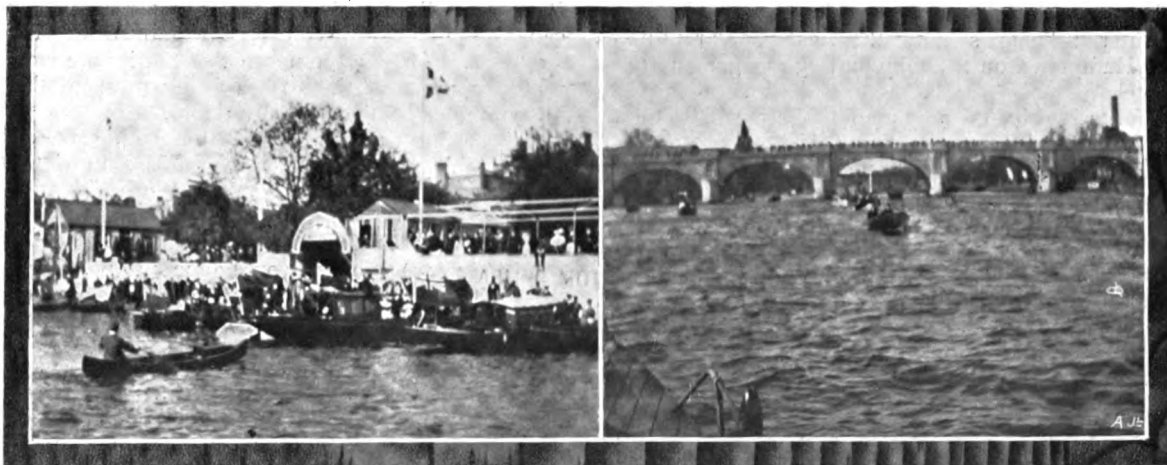
Track Record.—On Brighton Beach, U.S.A., Charles G. Wridgway created a new motor car track record for 1,000 miles, his time being 25h. 50m. 1s. Wridgway drove a 24-h.p. Peerless car. The previous best time was 29h. 53m. 37s., by Schmidt. In the 24 hours, Wridgway covered 943 miles, against Schmidt's 820 miles.

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driven over an Irish terrier who was standing quite still in the middle of the roadway. The unfortunate dog was shockingly injured, and his cries were not unnaturally heard at a considerable distance from the scene of the accident. Nevertheless, the driver did not deviate an inch from his course, nor did he pull up to see what amount of injury he had occasioned, or even whether anything could be done for the unfortunate victim. The two female persons, apparently well dressed, who occupied the victoria, took no notice whatever of the occurrence; they did not call upon the driver to stop, nor did they themselves display any anxiety as to what had happened to the victim of their conveyance. We hope that Mr. Purkis and the other members of the Canine Defence League will not permit this example of callous brutality and cruelty to pass unnoticed. If they allow the incident to pass without emphatic protest, people generally will know what to think!

MOTOR BOATING.



The "Fleet" at Kingston.

BRITISH MOTOR BOAT CLUB INAUGURAL MEETING AT KINGSTON-ON-THAMES.

The procession down the river.

The Algiers-Toulon Race.—For forty-eight hours from the original date fixed the weather was unpropitious, so that the start of this event had to be twice postponed, and it was not until 6 o'clock on the morning of Sunday last that the 7 starters, out of the 16 entrants, "toed the line" in the harbour of Algiers. From the first inspection of the competitors at the starting point, Fiat X., in spite of its modest dimensions, was the favourite, owing mainly to the fineness of its lines, and this opinion was justified by the result of the first day's race, in which the Italian boat got away first, and kept its lead throughout, arriving at Port Mahon, in Minorca, some two hours ahead of the next competitor. Though the sea in the neighbourhood of Algiers had calmed down considerably when the start took place, it was still reported to be decidedly rough in the neighbourhood of the Balearic Islands, and the successful arrival of the boats at the end of the first day's stage should go a long way to counteract the unsatisfactory impression produced by the proceedings at the Monaco meeting. The French Government, as usual, did everything to ensure the success of the race, and provided a torpedo-boat destroyer to convoy, look after, and ensure the safety of each of the competing motor boats. Thus the *Malgré-Tout* was conveyed by the *Carabine*, the *Quand-Même* by the *Arbalète*, the *Mercedes-Mercedes* by the *Pertuisane*, the *Mercedes-C. P.* by the *Hallebarde*, the *Camille* by the *Dard*, the *Heracles* by the *Sarbacane*, and Fiat X. by the *Arc*. The way was indicated by the two cruisers *Kléber* and *Desaix*, and the progress of the race was announced to Algiers approximately every hour by carrier pigeons despatched from the former cruiser. The start from Algiers took place at 6 o'clock in the morning, and Fiat X., the winner of the first day's run, arrived at Port Mahon at 6.15 in the evening. The second arrival was the *Camille*, piloted by Madame du Gast, at 10 p.m. The performance of the little Fiat boat was thus a very fine one, as it accomplished the 400 kiloms. separating Port Mahon from Algiers in the official time of 12h. 15m. The *Mercedes-C.P.* arrived at 10.43 p.m., *Mercedes-Mercedes* at 12.30 a.m. Monday, and the *Quand-Même* at 1.45 a.m., while at a quarter past 7 in the evening the *Heracles* was signalled off the port in a damaged condition, a state

which seems to have been shared to a certain extent by the *Malgré-Tout*, as after her arrival she signified that she did not intend to continue the competition.

Fiat X. is a boat, with hull by Gallinari, measures 8.90 metres in length, and is of the more or less conventional pattern, the flat-bottomed section not having been adopted. The engine is a 24-h.p. 4-cylinder Fiat motor, the bore and stroke of the cylinders being 125 mm. and 150 mm. respectively. It is provided with low-tension magneto ignition, and the time of ignition can be advanced or retarded in accordance with the system adopted on the Fiat cars. Bevel gear reversing mechanism is provided, and the boat is capable of attaining the same speed astern as forward, and the friction faces of the clutch are of steel and bronze. An interesting feature of the boat is that it is provided with a Thornycroft propeller.

A protest has been made against Fiat X. by Messrs. Charron, Girardot, and Voigt, who are the makers of the engine in *Mdme. Du Gast's Camille*, the second boat in at Port Mahon. Their objections are that Fiat X. was not decked, that she took fuel on board *en route*, and carried only four passengers instead of five.

The second stage of this race, from Port Mahon to Toulon, was started on Tuesday evening.

British International Cup.—The Eliminating Race for this cup is to take place off Bembridge, on August 1st instead of August 2nd, and immediately following this event, on August 2nd and 3rd, the Motor Boat Reliability Trials in Southampton Water will be held, instead of July 4th and 5th as previously determined.

Motor Boating on the Thames.—The first organised event of this nature took place on Saturday last, under the auspices of the British Motor Boat Club, when the members and friends took part in a procession—led by the commodore, Admiral Sir William Kennedy, K.C.B.—in the Kingston Reach. The meeting place for the boats was the landing stage of the Sun Hotel, and shortly after 4.30 p.m. the commodore hoisted the white

ensign on the *Elgiva*, and started off down the river to Teddington, followed by about twenty-five other motor boats of various descriptions. Having arrived at that end of the run the boats saluted the flagship, and returned towards Hampton Court, finally putting in again at the Sun Hotel.

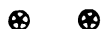
The following boats were among those which took part in the procession:—*Elgiva* (the flagship), *Deda* (Mr. R. J. Turk), *Veronique* (Mr. Heinke), *Ebury*, *Columbia*, *Shim-Po*, *De Novo*, and *Stirling* (all owned by Mr. Miles), *Bebe* (Mr. F. C. Blake), *De Dion* (Mr. J. B. Holmes), *Cora* (Mr. Melhuish), *Mi*, *Zephyr*, *Toreador* (Mr. J. O. Poulton), *Buffalo* (Mr. H. J. Nicholls), *Truscott* (Mr. Geo. Neill), *Simms* (Mr. F. R. Simms), *Inidia* (Mr. F. B. East), *Javelin* (Mr. A. G. Fentiman), *Viatic* (Mr. C. Jacobs), *Comet* (Mr. H. Norfolk), *Anona* (Mr. Waterhouse), *Thresher* (Mr. W. E. Owen), *Hemingford*, and *Fleurette*.

In the evening, the commodore presided over a club dinner, at which about a hundred members and friends sat down. After the loyal toasts, Admiral Kennedy, in a humorous speech, proposed the toast of the British Motor Boat Club. Mr. Alex. Kenealy proposed the toast of the "Commodore," and the Marquis of Ailsa (vice-commodore), was also among the speakers.

Two new meetings for motor boats are announced by *Les Sports*, the one entitled the

Coupe de Paris, which is to be contested for on the Seine in Paris on June 12th, when motor boats taking part will, in heats of three, be timed over the standing marine mile and the flying kilometre. The first heats will be run off with the stream, the semi-finals against the stream, and the finals with the stream. Entrance fees, 40 francs for racing craft, and 20 francs for cruisers. The other contest announced is the

Coupe de Trouville, which is an event for motor boats from Paris to the sea, the dates selected being July 23rd, when boats will start from Paris for Mantes,



MR. CHARLES F. PARSONS on Tuesday, when presiding at the Hotchkiss Ordnance Company's general meeting, spoke very strongly in regard to the automobile side of their business, which, he said, they had now successfully developed. Mr. Parsons, in referring to the subject of motor racing, said that:—

"He looked upon it as the curse of the automobile trade. The time was past when any useful object could be served by racing as it was carried out to-day, but the directors thought that so long as the largest manufacturers insisted on racing, the Hotchkiss Company could not afford to stand out. They could only hope that the majority of the existing companies would recognise that the reward was not commensurate with the expenditure and the other disadvantages entailed, and they might then expect some relief in this direction."

Dealing with the commercial side of the question, he stated that

"to create a really permanent and profitable automobile business the output must be largely increased, the cost of manufacture reduced, and the price to the public lowered. He believed there was going to be sooner or later a revolution in traction, and that the horse as a means of locomotion, transport, or draught would in another five or ten years be practically as extinct as the dodo. In addition to the possibilities regarding traction, he thought there was an equally large opening in connection with marine engines. The fact that they had successfully competed in three of the principal international events of the year spoke for itself as to the capacity of the company to turn out a marine engine equal to any for screw propulsion. The greatest development would probably be with an engine capable of burning oils with a much higher flash point than ordinary petrol or spirit, and the builders of marine motors would also have to learn how to build boats to put them in."

travelling to Rouen on July 24th. On the next day, 25th, the first stage of the racing will commence from Rouen to Tancarville, Havre being reached by the canal. On July 26th, the race will be from Havre to Trouville. Already the number of entries are mounting up to 50, amongst the names being most of the best known motor boats of the Continent.

In regard to these two events there appears to be a considerable amount of ill-feeling arising in view of the fact that the dates will in a measure clash with and tend considerably to weaken the annual race of a similar character, which is in the hands of the *Journal de l'Automobile* (*Le Velo*). There would appear to be, judging by this and other events of recent occurrence, a want of consideration amongst those controlling the new journal which is under the guidance of M. Prade. The feeling raised has led to an appeal to the A.C. de France, and it is stated that the *Sports* event will not be timed officially, whereas that of the *Velo* will be under official auspices, a state of affairs which would at least in Great Britain at once bring about the collapse of the proposed competition. In France, however, the same result is not necessarily so certain.

EVEN the distant Congo has now been invaded by the motor boat, and M. Charles Pierre, manager of the Sultanates of Haut-Oubangui, has made the voyage from Loukoulel to Bangui, some 1,400 kilometres in all, on the motor boat which has been christened after the last-named place. The boat is 31½ metres (103 ft. approx) long, and 5 metres in the beam, it has a 3-cylinder 30-h.p. motor actuating twin screws, 45 centimetres in diameter, at a speed of 600 revs. per min. The motor employed is the "Cazes," using ordinary paraffin oil. On its first trip the "Bangui" carried 53,000 kilogs. of various merchandise and 21 passengers, and the cost of running is said to come out very considerably cheaper than in the case of a steam launch of similar size.



EFFRONTERY in the way of theft can hardly go further than stealing a 20-h.p. Thornycroft motor out of its own garage, where it was comfortably ensconced. This, however, was what happened to the car of Mr. F. H. Baxendale, of Cadogan Gardens and Framfield Place. A motor car is not a very easy object to escape with, and the missing vehicle was discovered subsequently at Burford, and its self-appointed chauffeur duly taken into custody by the police.

EVERYONE has recognised that there are perils attaching to turning back where a motorist has been unfortunate enough to run over or knock down a foot-passenger. Nevertheless it is a duty that everybody sternly recognises that everybody else should perform. But not everybody is so unfortunate as the Australian doctor who, so the tale goes, having the misfortune to upset a pedestrian with his mud-guard, philanthropically turned round and ran back to render assistance. His car, however, was not very well under control, and just as the unfortunate man had recovered consciousness and was struggling to a vertical position, he was felled by the approaching motor car for the second time. Nothing daunted, however, the benevolent doctor again returned to his assistance, when a spectator plucked the prostrate foot-passenger out of the road and assisted him over a wall, remarking as he did so, "Be quick, he's coming at you again." And so the doctor had no damages to pay after all!

MOTOR CYCLING.



AUTO-CYCLE CLUB FERNHURST HILL-CLIMB.—No. 30 finishing. Mr. E. D. Fawcett on his Bat, 4-h.p. M.M.C. engine.

Auto-Cycle Hill-Climb at Haslemere.—The inhabitants at Haslemere were awakened on Saturday morning by the motor cyclists who had come down overnight for the hill-climb promoted by the Auto-Cycle Club, and were busy tuning up their machines almost before the local larks had commenced their customary carol. As no practising was allowed on the course, the competitors looked round for a suitable test hill for this purpose, and found a nice little rise just by the Haslemere Station, but this proved too much for the majority of them. After breakfast they rode over to the scene of the competition, and the morning was devoted to the weighing of the competing machines and their riders. The course consisted of a private road in the grounds of Mr. F. S. Philipson Stow, Blackdown House, Fernhurst, exactly one mile in length. It was almost ideal for the purpose, the surface was very good, but there was a rather nasty turn just at the commencement of the steepest part. This brought out the skill of the riders, as very great care had to be taken in negotiating it, and several of them had to go on the grass at the side of the road to get round. The competition itself started at 2 p.m., when Mr. S. F. Edge, who acted as starter and marshal, went up the course on his 6-cylinder Napier. On reaching the foot of the hill he sent off No. 1, the others following at two minute intervals, five minutes being allowed between the classes for those reaching the top to descend.

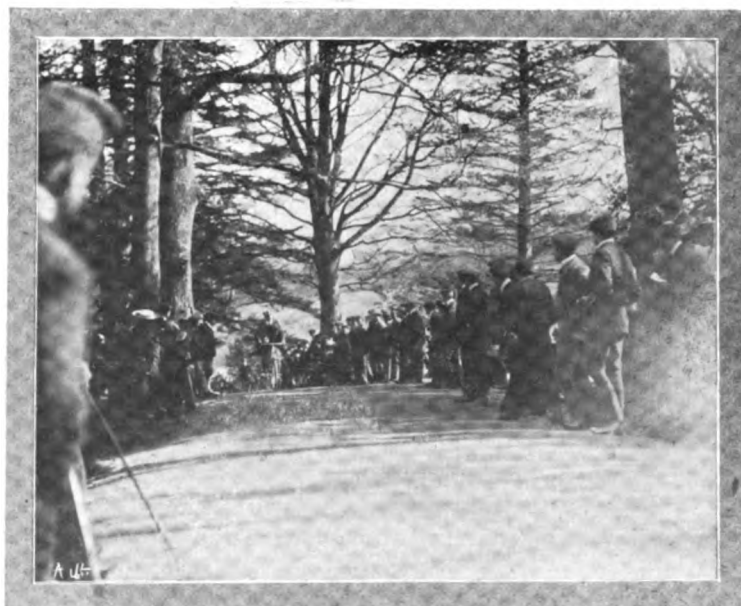
Of the seven starters in Class 1 (for machines with engines not exceeding 76 mm. by 76 mm., or the equivalent volume) only two managed to reach the summit, F. Hulbert, on a 2½-h.p. Triumph, succeeding in 2m. 28½s., and A. F. Ilsley, on a 2½-h.p. Phoenix, in 2m. 38s.

Eight started in Class 2, limited to machines with engines exceeding 76 mm. by 76 mm., but not exceeding 80 mm. by 80 mm., or the equivalent volume, but again only two managed to get up, A. E. Lowe, on a 3-h.p. J.A.P., being successful in 2m. 31½s., and K. W. Ayton, on a 3-h.p. Triumph, in 2m. 42½s.

In Class 3, for machines with engines exceeding 80 mm. by 80 mm., but not exceeding 85 mm. by 85 mm., or the equivalent volume swept out, eight started, and five were successful, the times being as follows:—J. Hancox, on a 3½ Roc, 1m. 58½s.; T. Silver, Quadrant, 2m. 9½s.; A. C. Wright, 3½ Roc, 2m. 35½s.; D. E. Brown, 3½ Ormonde, 2m. 59½s.; F. W. Applebee, 3½ Rex, 3m. 7s.

In the Open Class, which included racing machines, four started, and they were all successful. J. F. Crundall made the fastest time on his Humber racer, doing the mile in 1m. 48½s. In taking the turn, he had to get right on to the grass, and scattered the people who had crowded on to the bad corner, and, to rejoin the road, had to get over a small gully. He, however, safely accomplished this, and made the fastest time of the day. E. D. Fawcett, on a 4-h.p. Bat, took 2m. 7½s.; Wilbur Gunn, 5-h.p. Lagonda, 2m. 30½s.; and J. B. Walford, 3½-h.p. Ortona, 2 m. 52½s.

A. F. Ilsley, on a 4½-h.p. Trimo, was the only starter in Class 5, but he could not take his machine to the top.



AUTO-CYCLE CLUB FERNHURST HILL-CLIMB.—Mr. F. Hulbert on his 2½-h.p. Triumph at the steepest gradient on the hill. This is the point which was found too much for many of the machines, and where the majority of the spectators took up their position to take notes.

In Class 6, Wilbur Gunn was successful, on a 10-h.p. Lagonda tri-car, in 4m. 4½s.; and J. F. Crundall, on an Olympia tandem, in 4m. 31½s.

The awards of gold medals for the most meritorious performance go to Mr. A. F. Ilsley (2½-h.p. Phoenix) and Mr. J. F. Crundall (5-h.p. Olympia tandem).

The competition was a very great success, all the details being perfectly organised, even the route from Haslemere to Blackdown being indicated by means of printed notices, so that there was no possible excuse for people not finding the hill. The officials were very hospitably entertained at luncheon by Mr. F. S. Philipson Stow, and the thanks of those taking part are due to him for so kindly throwing his park open for the occasion. The judges were: Prof. H. L. Callender, and Messrs. M. O'Gorman, E. H. Cozens-Hardy, J. Lyons Sampson, G. F. Sharp, and Robert Todd. Messrs. H. J. Swindley, A. V. Ebbelwhite, and F. Straight, acted as timekeepers, and a number of members rendered yeoman service as stewards and signallers. The weather was beautifully fine, and a number of well-known motorists went down to witness the sport, including Mr. and Mrs. Chas. Jarrott, Colonel and Mrs. Mayhew, Mr. and Mrs. R. W. Buttemer, Earl Russell, and a number of others.

International Cup.—Entries for the British Eliminating Trials do not close until to-day, Saturday, in consequence of the date of the Selection Trials themselves having been postponed until May 31st.

For the French Eliminating Trials, the formal entries have commenced with the Moto Cycle Club de France; three Alcyons have been named to commence with, to be ridden by Anzani, Griet, and Tavenaux respectively.

Official authorisation has now been given for this race to take place on the Dourdan course, and the date has been fixed for Sunday, June 25th. The French Eliminating Trials are to be held on June 4th.

A very great concession has been made by the authorities in permitting the competitors to start at 10 a.m. instead of as hitherto at some unearthly hour of the morning, and all traffic on the circuit will be stopped until 6 p.m. The course consists of a circuit of

54 kiloms., starting on the Dourdan Road. There will be three neutralisations, viz., Dourdan, 8m.; La Foret de-le-Roi, 3m.; Ablis, 5m., making for the five tours a total of 1h. 20m. neutralisation.

Auto-Cycle Club.—The 100 miles Members' Penalty Run takes place to-day (Saturday), starting from the Angel, Thames Ditton. The competitors will be sent off at 2 p.m., instead of 11 a.m., as originally announced, and the course is to the 64th milestone on the Portsmouth Road and back. Riders are penalised 6d. for each stop they make, and 2s. 6d. in the event of their failing to finish within 6 hours' riding time, the maximum amount of fines payable, however, by one rider being limited to 5s. All fees and fines go to augment the prize fund. The event is a purely sporting one, and last year gave rise to a considerable amount of innocent pleasantry between the competitors.

Irish Motor Union.—The Annual 100 Miles Reliability Run, organised by the Dublin Centre of the Union, took place on Saturday last, the selected road being from Inchinore to Maryborough and back. Only two starters were to time, viz., Mr. T. W. Murphy (3-h.p. Singer with trailer), and Mr. E. A. Bannister (3-h.p. Minerva with Phoenix-Trimmo attachment). Tyre troubles eliminated Mr. Bannister before reaching Maryborough, and the cup, therefore, goes to Mr. Murphy, who completed the distance within the required time.

Tri-Car Competition.—Under the auspices of *L'Auto*, an international contest for tri-cars is being organised to take place in September. Vehicles eligible to enter as tri-cars are defined as 3-wheeled vehicles with 2 seats side by side or tandem. Weight light, between 80 and 150 kilogs. Only machines with a maximum cylinder capacity of 500 cm³ (½ litre) are admissible. The course will be 100 kiloms., to be covered in a maximum time of five hours. A kilometre on the flat and a kilometre on a hill will be timed, the total of these, and the time occupied in covering the 100 kiloms., determining the winner. Each constructor, French or foreign, may enter 3 vehicles. The entrance fee is 20 francs per machine.



Photo by H. W. Busbridge, Westcombe Hill, Blackheath.

BLACKHEATH AUTOMOBILE CLUB.—A gathering of the cars at the Opening Run of the Season.



The Lancashire Motor Company's petrol 'bus shown above has now been running between Surbiton and Kew Bridge since April 1st last, and has, we understand, covered a distance of more than 90 miles each day without missing a single trip. The Omnibus Company have now, we learn, ordered six more of these Crossley-Leyland 'buses, the construction of which was described by us recently.

CORRESPONDENCE.

. *The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.*

THE SHOW QUESTION.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—We would like to take this opportunity of thanking your correspondent for so lucidly and clearly explaining the departments of our business to the public generally. As, however, the other facts put forward by him are so inaccurate, it necessitates our dealing with his letter in detail, in order to make the matter perfectly clear.

In the first place, we would like to point out that Messrs. De Dietrich and Co. are one of the largest manufacturing firms in France, and have a very large output. For the purposes of the sale of their vehicles in England they have appointed us their sole selling representatives. At the same time they are members of the Society of Motor Manufacturers and Traders, and have paid their subscription to that society, and, therefore, have an equal right with every other member of the society in regard to any privileges in connection with that society. Messrs. De Dietrich have a right, in spite of the suggestion of your correspondent, to state how and when their vehicles shall be exhibited in England.

In the particular case in point, it is Messrs. De Dietrich's wish to show their vehicles at the November Show, and for this purpose they have applied for space at the Exhibition of the society.

On this point we may say that we are not in accord with Messrs. De Dietrich, as we hold most strongly that the date of the Show is wrong, and that nothing like the amount of business will be done in November as will be done in the earlier part of the year.

Messrs. De Dietrich wish to show their new models as early as possible; we, on our part, are merely concerned in the selling of the cars; hence our attitude is clearly defined.

The same remarks in every sense apply to the Olds Motor Works. Their position is identical. They are members of the society, and as manufacturers they want to show their new models at the same time as other manufacturers. At the same time, obviously, buyers of Oldsmobiles of the new models will not want

to place their orders in November for delivery in March, and on this point we are clear, as sellers, that the month of November is absolutely and entirely wrong.

In reference to the last suggestion in your correspondent's letter, we would point out that we have all along supported the society when we have been in accord with its policy; at the same time we have all along strongly advocated a Show in the early part of the year, and our business is too important for us to allow any sentiment in regard to any society to enter into the matter, when all the facts and ordinary common sense make it clear that the policy of the society is wrong.

Yours faithfully,

CHARLES JARROTT AND LETTS, LIMITED.

WILLIAM LETTS.

May 8th.

SPEEDOMETERS.

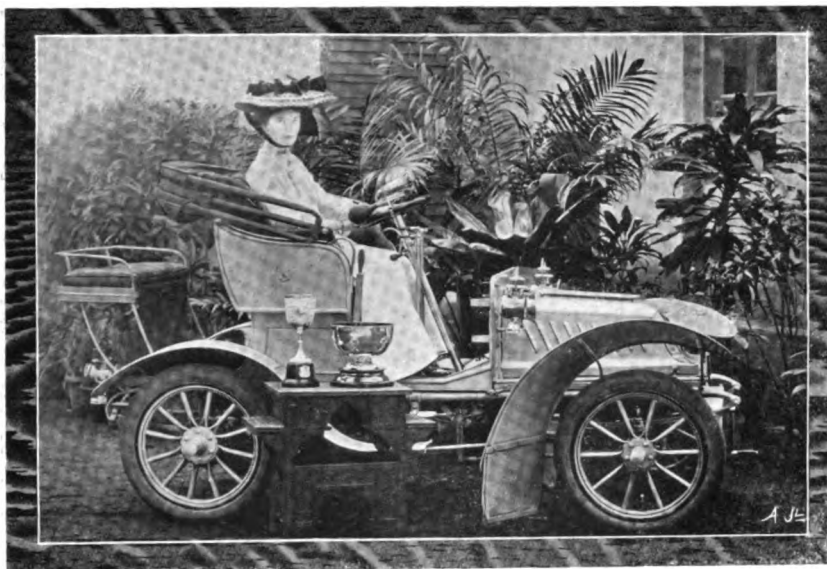
To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Noticing so many accidents of late through motors, I think some of them could be avoided if speed indicators were used. As a motorist of long standing, I was astonished to find after I had a speed indicator (Smith's Perfect) fixed, how deceiving speed is. It is most noticeable after going at a high rate of speed, and then dropping down to, say, 20 miles an hour. It seems as though you are only going 10 miles, and this may be the cause of some of the accidents, and, again, a speed indicator shows the motorist when he is going the legal speed, and he knows at once if the police are in order in stopping him for exceeding the regulation speed, and so saves a great amount of friction.

Faithfully yours,
MARK MAYHEW.

Bolingbroke House,
Battersea, S.W.

MR. H. J. MULLINER, of Brooke Street, W., writes us that about a fortnight ago he received a glass wind-shield off the dashboard of a car very much broken, and with brass fittings, but without any name or address attached. Possibly one of our readers may recognise the article, and communicate with Mr. Mulliner in the matter.



Mrs. J. H. Allen on her 6-h.p. De Dion car, which she drove in the Bengal Motor Car Trials in Class C. The two Cups are the prizes which she secured, one for the best performance by a driver, and the other Second Prize in her Class. Mrs. Allen maintained a good position from the start to the finish, and during the first day was unfortunate in losing 45 marks through running out of petrol. The second day she scored a non-stop run, and hers was one of the 12 cars which finished the course out of a total of 28 starters. Of these 8 were entered in Class C.

To allay the dust nuisance on the Seabrooke Road, Hythe, experiments are to be made with a coating of tar and sand.

THE success of the motor omnibuses in the Isle of Wight has already justified arrangements being made for additional rolling stock.

THE new motor car service put on at Weymouth by the Great Western Railway has been very much appreciated by the golfers on the downs.

E. J. PENNINGTON, after, for him, a considerable period of lying low, has again blossomed forth in the United States in connection with a million dollar concern entitled the Standard Oil Automobile Company. Needless to say, the usual motor which is to revolutionize the whole world is owned by this Company.

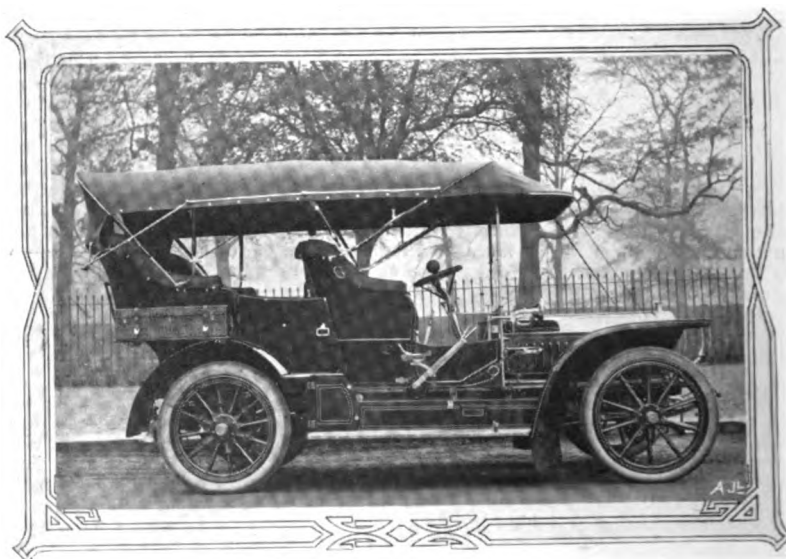
A TEST, extending from March 13th to April 19th, has, we learn, been made with a Londonderry steam wagon by the Co-operative Wholesale Society of Newcastle, who are running vehicles in that neighbourhood in competition with the railway. The results show that the distance travelled, in the 60 journeys that were made, was 654 miles, that the total weight carried was 274½ tons, that a day and a half was occupied in washing-out, and one day for repairs. It appears that the cost per ton mile worked out at 2d., that distances of 20 to 25 miles could be covered without

refilling the water tanks, and that the wagon has proved to be a remarkably good hill-climber.

THE German Emperor has just ordered a 24-40-h.p. Fiat car.

THE initiative of the Governments of Prussia and Saxony in the automobile question cannot be too ardently held up for the imitation of our own authorities. Recognising that the advent of the automobile has introduced totally different traffic conditions upon high-roads generally than ever prevailed before, and coming to the conclusion that to draw up regulations on such a question merely sitting around a table was ridiculous, the representatives of the two Governments have carried out an extended series of "personally conducted tours" on an extended scale, themselves travelling in automobiles. The result has convinced the officials concerned that the most serious attention should be devoted to motor car traffic, and every possible concession made in its favour. This is common sense.

The pedestrian who knows nothing of self-propelled locomotion from the inside is as little likely to take a judicial view of the situation, as an "Orange" juryman in Ireland to acquit a Nationalist fellow-countryman arraigned before him.



When Cape-cart hoods were first introduced into England for motor cars, they at once bounded into success, and in many ways improvements have since from time to time been made in adapting them for automobiles. An instance of this is shown in Lord Battersea's 6-cylinder 30-h.p. Napier car, seen in the above photograph, which has been specially designed with ample luggage room for touring. The Cape-cart hood can be raised as shown to cover the whole body and extend over the glass wind shield in front of the driver. In fine weather it can be thrown back to extend over the rear of the car to form a dust shield. Lord Battersea who, although an enthusiastic supporter of automobilism, is no less an ardent huntsman and yachtsman, has just started on a 3 months' tour on the Continent in the car of which we now give a picture.



On the Swiss railway between Uerikon and Bauma the above special petrol motor coach is in regular service. It has been specially constructed for the severe gradients which have to be overcome, and seats 25 passengers. The builders of this coach are the Orion Company, of Switzerland, one of whose chassis, with an ordinary omnibus body, has now for a long time been in regular service on the Kensington Road by the London General Omnibus Company.

PUBLICATIONS RECEIVED.

Modern Iron Foundry Practice (Part I.). By Geo R. Bale, A.M.I.C.E. London: The Technical Publishing Company, Limited.

Ordnance Survey Folding Pocket Maps. South Devon. (Sheet 22.) Isle of Wight and Adjacent Coast. (Sheet 23). London: Board of Agriculture and Fisheries. Price 2s. each.

Hand-Book of Gasoline Automobiles, 1905. New York: Association of Licensed Automobile Manufacturers.

English-French and French-English Dictionary of the Motor Car, Cycle and Boat. By Frederick Lucas. London: E. and F. N. Spon, Limited. 5s. net.

Catalogues.

British-Built Immisch Launches. The Immisch Launch and Boat Company, Limited, Hampton-on-Thames.

Motor Car Tyre Repairs. The Midland Rubber Company, Limited, Birmingham.

WE have received Sheets 11, 15, and 19 of the maps of the Ordnance Survey, published by the Board of Agriculture. The scale of this series is four miles to the inch, as distinguished from the general series which we have previously noticed, in which the scale was two miles to the inch, and the special series of detailed maps, in which the scale is one mile to the inch. The first of the above sheets shows the country of which Derbyshire is the centre, and extends from a little beyond Stockport in one direction, north-west to Stamford in the extreme opposite direction, the opposite limits being Market Rasen and Wolverhampton respectively. Sheet 15 deals with the West Midlands, including the country east and west of the line joining Oxford and Birmingham, extending from Bedford in the east to just beyond Gloucester and Ledbury in the west, while Sheet 19 illustrates a large slice of the South-west of England from Rickmansworth in the north-east to beyond Blandford in the south-west, taking in Bath, Southampton, and the top end of Southampton Water and the top of the New Forest, and including Salisbury and Salisbury Plain. The finish and detail of the maps is of the same high class as in the other series, the colours being identical, the main roads being shown yellowish brown, the rising ground suitably shaded, and with the tracts of woodland and forest green as usual, while the principal elevations are indicated with great accuracy. The present series is published at 1s. 6d., mounted on linen, and will in

general be found of much more use by automobilists, as the scale adopted enables a much larger area of country to be included on a single map. In addition to the above we have also received Sheets 93, 53, and 84 of the two miles to the inch scale, the first dealing with Exeter and a large portion of Dartmoor, the second covering the country round Coventry, Warwick, and Northampton, the third embracing Barnstaple, Ilfracombe, and the whole of Exmoor south to Tiverton, these sheets being charged for at the rate of 1s. each.

IF the Berlin police have their way there will be no false evidence on either one side or the other about the speed at which automobiles may be proceeding. They have been experimenting with a device in the nature of a speed indicator, which not merely accurately indicates the speed, but shows it in large figures on the front of the approaching car, at the same time recording the speed at which every 100 kiloms. was traversed on a roll of paper, which is presumably locked inside a box to which the police alone have access. If the machine is reliable, there will be no more hard swearing in the neighbourhood of Berlin in motor car cases for the future.



COMMERCIAL POINTS.

Messrs. Perman and Co., Limited, 29A, Charing Cross Road, W.C., have been appointed the sole British agents for Delahaye cars.

MR. E. SHRAPNELL SMITH informs us that as from May 1st he has disposed of his consulting practice in heavy motor transport to Mr. Douglas Mackenzie, A.M.I.M.E., who will continue in the same office at Cecil Chambers East.

MR. ERNEST A. STEPHENS, who has been for several years manager of the Clipper Tyre Company, and who handled the Clipper Continental motor tyre business during the existence of the agreement between the Clipper and Continental Companies, has now joined, we are informed, the Continental Tyre and Rubber Company (Great Britain), Limited, and will take up his new position shortly. Mr. Paul Brodtmann, the manager of this Company, who is an officer in the German Army Reserve, has to undergo eight weeks' military exercise in Hanover, and there is no doubt that his absence must be a great inconvenience for their business in the height of the season.



A Royal Mail Van supplied by the Motor Car Emporium, Limited, for the Birmingham service. It is fitted with a 15-h.p. 4-cylinder engine, a gear-box giving three forward speeds and a reverse, and the rear wheels are driven by side chains. The carrying capacity is 30 cwt., and the average speed about 12 miles per hour.

British Exports and Imports of Motor Cars, &c., for 1905. *

1905.	Exports, British and Irish make.				Foreign and Colonial Re-exportation.			
	No. of Cars and Value.	Parts Value.	No. of Motor Cycles and Value.	Parts Value.	No. of Cars and Value.	Parts Value.	No. of Cycles and Value.	Parts Value.
January	77	£ 25,590	£ 7,480	58	£ 2,026	£ 673	50	£ 19,006
February	62	20,209	6,335	63	2,389	1,003	79	39,772
March	49	14,749	7,862	46	1,471	1,024	36	20,783
April	55	16,590	9,635	46	1,459	608	38	19,697
Total	243	77,138	31,312	213	7,345	3,308	203	99,258
								18,590
								32
								927
								304

NOTE.—For 1904 comparative figures see full table for the year in our issue for January 21st, page 91.

NEW COMPANIES REGISTERED.

[Taking powers to manufacture or deal in motors, motor cars, or accessories, either as their principal or parts of their objects.]

Commercial Press (Limited).—Capital, £2,200 in £1 shares (200 founders'). Object, to acquire the newspaper known as the *Commercial Motor*. First sole director, E. Dangerfield.

Frank Morris (Limited).—Capital, £1,000 in £1 shares. Object, to carry on at King's Lynn the business of manufacturers of and agents for motors, motor cars, &c.

Motor Supply Company (Limited), 10 and 11, Jermyn Street, St. James's, S.W.—Capital, £1,000 in £1 shares.

Noble Automobile Syndicate (Limited).—Capital, £12,000 in £1 shares. Object, to adopt an agreement with P. W. Noble, J. B. Bowen, and D. C. Wybrants, trading as the Noble Automobile Company.

Sandringham Motor Works (Limited).—Capital, £12,000 in £1 shares (5,500 preference).

Imports.

1905.	No. of Cars and Value.	Parts Value.	No. of Motor Cycles and Value.	Parts Value.
January	362	£ 149,578	£ 36,608	57
February	431	195,978	56,773	102
March	560	239,091	75,403	152
April	544	225,012	68,891	192
Total	1,897	809,659	237,735	503
				17,436
				7,670



BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E.

Thanet House, Temple Bar London.

The first date given is the date of application; the second, at the end, the date of the advertisement of the complete specification.

11561. 10th May, 1904. Improvements in and connected with Internal Combustion Engines. T. D. Kelly, South Avenue, Southend-on-Sea. The object of this invention is to so combine two cylinders having pistons of two diameters that each shall assist the other in completing the cycle of operations. There are two figures. Figure 1, is a part sectional elevation to a large extent diagrammatical. The working cylinders, A B, and the pump cylinders, A' B', have pistons with two diameters, C C' and D D'. The pump cylinders, A' B', are connected to the working cylinders, A B, of the opposite engine

piston, D', is forcing the combustible charge into and compressing it in the pipe, E. As soon as the compression caused by the explosion in the working cylinder, A, has been reduced below the pressure in the pipe, E, the new charge will lift the valve, T, and enter the cylinder, A. It will be noted that the air in the delivery pipe enters the working cylinder in advance of the working charge so that back firing is prevented, and the air acts as a scavenging agent in injecting the products of the previous explosion through the exhaust pipes, X. The pistons are connected to opposite cranks, V V', on the shaft, W, through the connecting rods, U U'. The governor, S, by means of the groove, J, on the sleeve, I, operates the valves, H H', through the fork, K, and the lever, M, pivoted at P. It is connected by a lever, R, and a connecting link to the controlling valves. The same operation takes place in the other cylinder, its charge of combustible gas being delivered through the valve, T', to the cylinder, B. May 4th 1905.

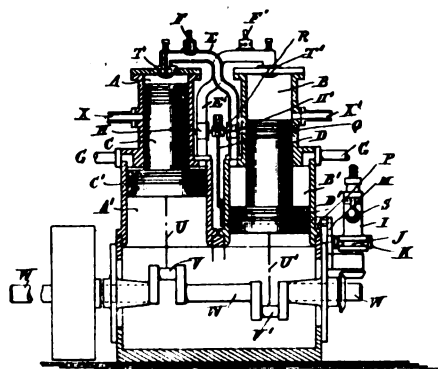
9522 26th April, 1904. Improvements in Friction Clutches, Brakes, Dynamometers and the like. Professor H. S. Hele-Shaw, F.R.S., Liverpool University. This invention relates chiefly to the friction plates in friction clutches and brakes, and it has the object of rendering more certain the disengagement of the plates when the disengaging pressure is relieved. There are nineteen figures.

connected to the driven sleeve, B, the connection being made by providing each set of plates with teeth, *t*, adapted to engage in a series of grooves, *g*, formed in the driving and driven parts respectively. When the plates are subjected to axial pressure causing frictional engagement, the power is transmitted from the driving to the driven part through the teeth of the respective plates. When the axial pressure is withdrawn, the plates should separate slightly to free each other so that the clutch may run free, and this separation is generally assisted by small springs placed between adjacent plates of a set. A separation takes place more promptly on the release of the engaging pressure when the area of the bearing surface between the edges of the teeth on the plates and the sides of the grooves in the sleeve and casing is increased. An increased width of the bearing surface of the teeth to twice or three times the thickness of the plate is provided. Saddle pieces, *l*, of bent metal of the same length and depth as the teeth, *t*, are adapted to fold over the teeth. These have slots in the centre of the bend, into which fits the projecting tongue, *t'*, of the tooth. The essence of this invention consists in providing the teeth of the thin plates which form the engaging surfaces with saddles or their equivalent, which by increasing the bearing surface of the teeth prevent indentation. May 4th, 1905.

Patent Specifications Published.

Applied for in 1904
Published May 11th, 1905.

- 1,409. S. Z. DE FERRANTI Turbine engines.
- 3,367. — SCOTT. Intl. combn. engines.
- 8,610. P. THEZARD Explosion motors.
- 9,047. T. GARE. Tyres.
- 10,486. A. SYDENHAM AND W. T. SHAW. Change-speed gear.
- 10,634. F. C. HASTE. Speed gears.
- 11,307. R. LANG. Variable speed gear.
- 12,330. J. BEACH. Intl. combn. motors.
- 13,515. V. C. BAKER. Motor car bodie.
- 13,787. A. F. COLE Lubricators.
- 13,830. B. M. DRAKE. Screens.
- 13,878. G. PILKINGTON. Motor cycle frames.
- 15,400. D. A. BHARUCHA. Lubricator.
- 15,924. L. S. DYER. Anti-skidder.
- 14,664. A. DUCASBLE. Tyres.
- 19,818. G. REBEL AND A. WOHLFARTH. Motor cycles.
- 21,610. J. F. O. WESTON AND C. R. LEWIS. Gloves.
- 29,412. L. RENAULT. Carburettors.



by the pipes, E E'. Air inlet-valves, F F', are fitted to each pipe, E E', connecting the working and pump cylinders and a gas mixture pipe, G G', for each pump cylinder, A' B'. A controlling valve, H H' is fitted in each delivery pipe from the pump cylinder to the working cylinder to control the admission of air to the pump cylinders, A' B', and the pressure of combustible charge from the working cylinders, A B. On the working stroke of one piston, the combustible charge is drawn into the pump cylinder of that engine, and at the same time a charge of air is drawn through the air valve into the delivery pipe, some of it entering the pump cylinder, say, A', at the same time that combustible charge is drawn into the pump cylinder through the pipe, G. During this movement the working piston, D, of the other engine is compressing its charge, and the pump

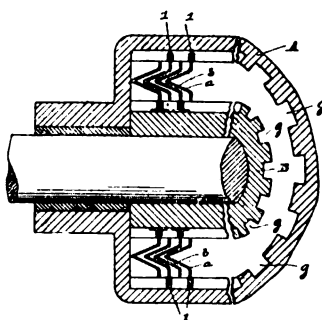


Figure 1 is a section showing the general arrangement of the friction plates. In clutches of this class there are two sets of plates, *a* and *b*, one set, *a*, connected to the driving sleeve, A, and the other set, *b*,

The Automotor Journal, May 20th, 1905.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

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No. 228. (No. 20, Vol. X.)

MAY 20TH, 1905.

[Registered at the G.P.O.
as a Newspaper.]

[Weekly, Price 3d.
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ISLE OF MAN ELIMINATING TRIALS.—Looking back down Craig Willie's Hill. One of the stiff bits on the course.

THE AUTOMOTOR JOURNAL.

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When any difficulty is experienced in procuring the Journal from local news-vendors, intending subscribers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.

NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C., by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
May 20 ...	Motor Union Inter-Club Meet (Welbeck).
May 20 ...	200 Miles Trial (Motor Cycling Club).
May 30 ...	*Gordon-Bennett British Eliminating Trials.
May 31 ...	Auto Cycle Trials and "Selection" Race.
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.).
June 10 ...	London-Edinburgh (Motor Cycling Club).
June 12 ...	Filey Sands Races (Yorkshire A.C.).
June 14 ...	Bexhill Race Meeting.
June 24 ...	100 Miles Passenger Trial (Motor Cycling Club).
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 8 ...	Auto Cycle Club Consumption Trial.
July 12 ...	*Hill-Climb (Henry Edmunds Trophy).
July 19-22 ...	*Brighton Speed Races.
July 27-28-29 ...	*Blackpool Motor Meeting.
July ...	24 Hours Run (Motor Cycling Club).
Aug. 2-3 ...	*Motor Boat Trials (Southampton).
Aug. 11 or 18 ...	*Quarterly 100 Miles Trials.
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 26 ...	Inter-Team Trial (Motor Cycling Club).
Sept. 9 ...	Brown Cup (Motor Cycling Club).
Sept. 12 ...	Auto Cycle Club Race Meeting.
Sept. 14 ...	*Tourist Trophy (Isle of Man).
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).

* Automobile Club of Great Britain and Ireland Events and Papers.

Sept. 20, Oct. 24 *Van Trials.
Oct. 4 ... *Speed Trials.
Nov. 10 or 17 *Quarterly 100 Miles Trials.
Nov. 17-25 ... Society of Motor Manufacturers and Traders Exhibition at Olympia.

Foreign Events (Trials, Races, &c.).

1905.

May 11-25 ...	Stockholm Automobile Exhibition.
June 16 ...	French Selection Race for G.B.
June 23 ...	International Motor Cycle Cup.
June 20-28 ...	Aix-les-Bains Week.
July 1 ...	Boulogne-Cape Gris-Nez (Motor Boats).
July 5 ...	Gordon-Bennett Race.
July 9-22 ...	Ostende Automobile Meeting.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Boulogne-Folkestone (Motor Boats).
July 16 ...	Mont Cenis Hill Climb.
July 20-26 ...	Paris-Trouville (Motor Boats).
July 28-Aug. 8 ...	Paris Industrial Vehicles Trials (A.C. France).
July 30 ...	Gaston Menier Cup (Motor Boats).
July 31 ...	Anthony Drexel Cup (Motor Boats).
Aug. 6-7 ...	Circuit des Ardennes.
Aug. 10-16 ...	Herkomer and Bleichroder Races.
Aug. 12 ...	International Cup for Motor Boats.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Tri-Car Competition (L'Auto).
Sept. ...	Vincenzo-Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.
Sept. ...	Tourist Car Trial (A. C. de France).
Sept. 3-10 ...	Royan Meeting.
Sept. 3-10 ...	Spa Automobile Club.
Sept. 11 ...	British International Cup (Motor Boats Arcachon).
Sept. 12-14 ...	Lake Lucerne Motor Boat Meeting.
Oct. 1 ...	Chateau Thierry Hill Climb.
Oct. 15 ...	Gaillon Hill Climb.

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PASSING EVENTS.

Another Motor Boat Fiasco.

THE pessimistic quidnuncs who go about shaking their heads and prophesying disasters may, as regards the Mediterranean Motor Boat Race, now enjoy the melancholy satisfaction of claiming "that they had told us so." We ourselves must plead guilty to being among the number of these prophets of misfortune. *Apropos* of the race, we observed on the 29th of April that

"Considering how fully the Monaco boat races demonstrated the imperfect sea-going capabilities of high-speed motor boats, as at present constructed, it is devoutly to be wished that this long sea race (500 miles from start to finish) will not be productive of any serious accident. The Mediterranean is notoriously squally and uncertain, and serious storms get up with astonishing rapidity. At Monaco, the boats that suffered could be towed quickly into port and their occupants rescued, but matters will be very different in the case of a competition where, at times, the boats concerned will be 100 or more miles from land."

Never was a prophecy more absolutely fulfilled. The first day's race, as our readers will remember, was, on the whole, fairly satisfactory, and showed that, given conditions on the high seas not too unfavourable for its capabilities, the motor boat could attain very high speeds, and maintain them for considerable periods of time. But the second stage of the race was a very different affair altogether. Though delayed for some time by what amounted almost to a real storm, the adventurous competitors finally set forth from Port Mahon for Toulon, on Saturday morning, and they were little more than halfway across to the goal when the Mistral, that terror of the Mediterranean, came on to blow. Rougher and rougher became the sea, and the commander of the French squadron of cruisers and torpedo boats, for whose presence the competitors may thank the French Government and their lucky stars, signalled to the motor boatists to run for shelter to the Spanish shore. There are none so brave as those who are ignorant of the conditions under which they are placed, and tyros on sea, and Bank Holiday excursionists on our cliffs, will attempt feats which would appal the oldest mountaineer or the hardest sailor. So the motor-boatists would have none of the Spanish coast, and went on their way—their boats in most cases to the bottom, and themselves, after more or less serious discomfiture, to comparative safety on their convoying torpedo boats.

The effect, therefore, of the venturesome proceedings has been on the whole most unbeneficial to aquatic automobilism. Everybody knew before that on relatively smooth water the modern motor boat can get up and maintain a very high rate of speed. It was also known, as the result of the Monaco competition, that given even moderately rough water the danger to these frail craft at once becomes extreme. These facts have been once again demonstrated by the Algiers-Toulon Race. The first day showed the high speed that can be developed, the second how utterly unsuitable the high-speed motor boat designed for lake and river is for the high seas. *But we knew both these things before*, so that nothing has been added to our knowledge, and the only effect is that the Press are beginning to cry out against motor boat racing in much the same strain as they did against motor car racing in the days after Paris-Madrid. In this, the Press is unquestionably right, and we trust that the projected Atlantic race will be abandoned, and that we shall see no more of these extended boat races on the high seas unless the competing boats are properly

built for the job. But for the paternal care of the French Government, the fiasco would have been a tragedy, and Governments cannot be expected to provide convoys at the public expense whenever a number of plucky but inconsiderate enthusiasts think fit to put their lives in jeopardy for no really useful purpose.

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A Triumph of Darkness.

217 MEMBERS do not constitute a very full House of Commons, but that, out of that number, 109 should have deliberately opposed the Bill for rendering the carrying of lights on all vehicles after dark universally compulsory is very sad and painful evidence as regards the general intelligence and efficiency of our legislators, and the sort of action they are likely to take on any question of general public importance when left to themselves, and not driven into the division lobbies by the party whips. This magnificent majority of one against a useful measure—a measure in which every automobilist is interested—was due to the recognition on the part of those Members who formed it of the paramount power of prejudice and laziness amongst their constituents. There was no attempt at argument. The Bill was opposed—Mr. Wason, of course, being in the vanguard of the opponents—because country farmers dislike the trouble of putting lights on their vehicles. It was opposed because it would diminish the chances of accident to automobiles and other fast traffic after dark. This was practically admitted. And it was opposed (Heaven save the mark) in the name of freedom and progress, because a universal measure of this kind would deprive local bodies of their initiative in such matters! This, it will surprise nobody, was the attitude of Mr. Wason, who, with a fine confusion of metaphor worthy of an Irish Member in a paroxysm, declared that "peeping out from the silken petticoats of Mr. Bigwood's oratory was the cloven hoof of a reactionary Toryism, and behind it was the curly tail of the continual and ever increasing demands which were made by a very small but selfish class on the liberties of the people." We commend this imagery of a "continual demand" with "a curly tail" to the attentions of our contemporary, *Punch*. One wonders where these champions of this type of freedom were when the law requiring universality of lights for bicycles and motor cars was introduced. Even Mr. Labouchere was against the Bill, and his views, for a Radical Member, it must be admitted, displayed a singular measure of reaction and ignorance. But perhaps too much importance should not be attached to his utterances, as he went out of his way to deny the charge which nobody had made, that he was speaking on this Bill in order to prevent the Women's Enfranchisement measure, which was coming on afterwards, from getting a hearing. What a melancholy commentary on the efficiency of Parliament as a law-making machine, and what a sample of the hold prejudice has upon our legislators, the whole farce supplies! One of the speakers for the Bill said he was in favour of it as the result simply of personal experience. "Last summer, he was cycling in the neighbourhood of Slough, and noticed an object at the side of the road, which turned out to be a cyclist who had been seriously injured through colliding with a wagon which did not carry a light. He rode off for assistance, but the man died in the space of a few hours. It appeared that the wagoner proceeded on his way without taking the slightest notice of the injured cyclist." This single incident should,

one would have thought, have been enough to convert any rational or humane assembly to change its views as regards the advisability of allowing the last word in such matters to be pronounced by a local authority. Over and above this, there have been countless accidents to motor vehicles, notably to the Duke of Connaught's car last year, which shows the really serious danger which unlighted vehicles on our public highways are. It is a more than disconcerting reflection that it is to the deliberations of gentlemen of the calibre of the 109 who were in favour of darkness rather than light that the future of a great industry will be entrusted when the present Motor Car Bill comes up for review.

An Uncalled-for Attack.

THE same spirit was displayed by a number of members who have given notice that they intend to move an adjournment of the House in order to call attention to the lack of sympathy displayed by the Local Government Board towards local authorities. That the gentlemen who take the views we have referred to above, on an important public question, should look upon a Government department as primarily designed for the display of sympathy, can hardly astonish anyone, however much it may contribute to general entertainment. The notion of the Local Government Board being censurable for not displaying more sympathy to county and district councils, who, we presume, are the "local authorities" referred to, is distinctly delightful. What is intended, of course, by this lack of sympathy is that the Board has not seen its way to granting the limitation of speed for motor cars to 10 miles an hour, applied for by a number of local authorities. Well, the whole object of giving the Board discretion in this matter was to prevent the unreasonable and prejudiced action of local authorities having full sway. In all the cases where the application has been made, an elaborate enquiry has been held, and if the officials of the Local Government Board are not, after such enquiry, competent to decide whether the limit asked for should be imposed or not, then they are not competent to conduct a Government department. Anti-automobilists, of course, anticipate that this 10-mile an hour limit in certain districts would prove a potent means of destroying, or at any rate hampering, the automobile movement. That the Local Government Board has not seen eye to eye with them in this respect naturally makes them very angry. But in spite of the vote in favour of darkness rather than light, to which we refer above, we hardly think that the majority of the House of Commons will support this vote of censure on one of our most useful and efficient Government offices.

The motion should be a warning of the ceaseless activity and the undying hatred of the opponents of automobilism. But there is one consoling feature in the situation. Just as a connection has been established between good harvests and sunspots, so the connection of cause and effect has been established between periods of dryness and outbursts of anti-automobile fanaticism. When the roads are dusty, Mr. Wason, Mr. Channing, Mr. Wanklyn (*et hoc genus omne*), break out in the House of Commons. It is satisfactory, however, that they have been breaking out thus prematurely. Nothing in this country ultimately benefits a movement more than unjustifiable and illogical attack. It may have a prejudicial effect in the first instance, but, with absolute certainty, popular judgment swings round when it has had time to recognise the prejudice and unfairness of the attack. There will be

plenty of time for this reaction between now and the introduction of the next Automobile Bill, so that we rather welcome than otherwise this premature action of our opponents.

Worse Than We Had Expected.

WE have no special brief on behalf of the London ratepayer. It is probably largely his own fault that he has come to be looked upon, by those who have the power, mainly as a sheep with an inexhaustible fleece, whose vocation in the universe is to be shorn often, and shorn close. Still, one would not be human were one not to experience a twinge of compassion on beholding him bound, helpless, and about to be immolated as a burnt offering on the altar of what some of the papers (forgetful of the copyright in that expression), have termed "The Juggernaut which takes its annual toll of human life"—to wit, the electric tram. We protested strongly against the County Council's scheme for buying up and electrifying the North London tramways when we understood that the sum to be extracted from the pockets of the long-suffering ratepayer for this purpose would only amount to something over 3 millions, but experts have now been going into the figures, and there seems to be a general consensus of opinion that the stately sum of 12 millions, a cost which has not been hugely exceeded for the whole navy of Japan, will be required. This is always the way with municipalities. They make out an estimate and obtain Parliamentary powers on that basis. Then they come to Parliament and say that the sum has been found not to be nearly sufficient, but as the work has been begun, it must be finished. The situation would be bad enough were the electric tram the only means of locomotion—the only invention of modern times capable of coping with urban traffic. It would be bad enough, as we say, even then, because it is by no means clear that the electric trams which the Council does run are being conducted at a profit. The system of auditing municipalities' accounts, to which we have drawn attention before, gives no guarantee whatever that their trading is conducted on business principles. How much worse is the situation when it is recognised that every day witnesses the growth towards perfection of the most successful competitor of the electric tram—the automobile 'bus. If the profit of running an enormous system of electric trams has been doubtful in the past, it can hardly continue to be long doubtful in the future, when the motor 'bus really begins to make its competition felt. A body with the real interests of its constituents, general social progress, and the promotion of the best means of traffic in the Metropolis at heart, would hesitate to swamp such an enormous sum in a doubtful undertaking. It would at least have devoted a portion of this proposed mammoth expenditure to a trial with newer and more promising means of locomotion. What the inner motives which influence County Councillors in this matter may be, we are at a loss to say, though considering the immense amount of money involved, and the enormous interests which certain large contractors have in the work, there are many people who would be capable of making a shrewd guess. But it is particularly unfortunate to find a proposal on foot to victimise the London ratepayer on such a scale, when the object aimed at is really not progress, but to rush through the perpetuation of an antiquated system before it has been hopelessly superseded.

THAT these contentions are not based on the views of irreconcilable opponents, is sufficiently proved by the warning addressed to the Council by the chairman of their own Finance Committee—Lord Welby. In entering upon a scheme of this magnitude, said Lord Welby, "the financial considerations should be most carefully weighed." Lord Welby continued:—

"There are various factors in the solution of the traffic problem of London the operation of which it is impossible to foresee, but which must have a bearing upon the financial results of the Council's tramways. We refer to the tube railways now in course of construction, representing a very large expenditure of capital, the probable electrification of suburban railways, and the newly-arrived motor omnibus.

"These considerations, having regard to the comparatively small margin of surplus shown by the foregoing estimates, appear to us to point to the necessity of the strictest economy in capital expenditure, and of exercise of caution in dealing with proposals to lower fares or to increase the cost of working the service."

Bearing in mind that Lord Welby is practically an official of the Council, and that the committee over which he presides is composed entirely of its members, the significance of this caution can hardly be over-rated. It is more than a justification of all that has been advanced above.

Sound Policy.

THE committee of the A.C.G.B.I., at its last meeting, held on Wednesday of last week, unanimously passed the following resolution:—

"That the Automobile Club will not sanction the racing of motor cars except on specially reserved tracks."

Owing to recent incidents and accidents, hostility to the automobile movement, which in many minds was slumbering, or at any rate quiescent, has been, it is almost superfluous to observe, once more considerably inflamed. To some of the results in Parliament, not altogether without their amusing side, we refer elsewhere. In general there is a sort of popular idea that many automobilists spend a large proportion of their time in officially or unofficially racing with their fellows on our roads. The popular mind does not discriminate, and the holding of hill-climbing competitions, which, of course, are not races at all, but merely tests of horse power and efficiency of transmission, has no doubt, to a large extent, given rise to this fallacy. It is well, however, that the fallacy should be exploded as quickly and promptly as possible, and this resolution of the club committee ought undoubtedly to have that effect. It means that there will be no more road racing, either official or unofficial. The club takes complete control of all automobile competitions and races that may be held in the United Kingdom. Without its consent, no race or record is recognised, and any persons attempting to hold such a competition without the club's permission and countenance can at once be debarred from competing in any of the club or other recognised events, which is a serious penalty to those who would be thus excluded. The committee's resolution will therefore have a calming effect upon the popular mind. The club has, from its foundation, set itself, as we have never omitted an occasion to point out, against anything savouring of reckless driving or unnecessary speed upon our high roads. It is only in accordance, therefore, with its traditions and invariable course of action that it should at the present crisis thus emphatically discourage and draw attention to its interdiction of one of the chief inducements to excessive speed in public. Of course, where a great international

event is concerned, and where by legislative permission certain roads, as now for instance in the Isle of Man, or as later will be the case on the Brighton Madeira Walk, are set apart with the full consent and countenance of the authorities concerned, the prohibition of the club does not apply. But that need not in any way disconcert the general public, for such events are exceedingly few and far between, and when they are held, all the inhabitants of the neighbourhood, and, in fact, of the United Kingdom, have adequate and ample notice of what is going to take place, while all danger to the public is eliminated by the exceptionally careful precautions which are taken.



THERE has been a general abatement of anti-automobile feeling in the neighbourhood of Ripley, to the no small annoyance of the few fanatics who still exist in that village. In fact, everyone there is receiving automobilists with open arms, and the almost continuous passage of motor vehicles through the streets on Saturdays and Sundays is hailed with satisfaction or, at worst, with indifference. This alteration in feeling is not due, or at any rate not wholly due, to the translation of Sergeant Jarrett to another sphere of activity. It has a more simple explanation. The parish council has decided to water the main street, and has actually kept the greater part of it efficiently watered. The consequence is that no one is annoyed by the dust, and no one is angry with automobilists. On the contrary, everyone is prepared to profit—particularly the inn-keepers—by the custom which they bring. There is some outcry about expense, but the movement has made the village such a pleasant place to stop in that, if it is continued, we think the increased ratepaying power of the community will certainly do more than cover the small additional expense. If country villages on our main roads would more generally adopt this practice, there would undoubtedly be a diminution in the hostility to the automobile movement, and a general improvement in the health and temper of the inhabitants.

THE MOTOR PERIL.

Shocking Motor Car Tragedy.

ANOTHER horrible occurrence took place on Tuesday last in the Commercial Road, E., which no doubt will go to swell the official list of motor car accidents which are regularly compiled for the delectation of the sensation-mongers in and out of Parliament. A middle-aged man, having the appearance of a ship's fireman, deliberately threw himself in front of a motor van as it was proceeding slowly down the street and was crushed to death. No doubt in the opinion of gentlemen like Mr. Wason, when such shocking tragedies are possible with a motor car, all automobiles ought at once to be banished from the face of the earth. From the point of view of automobilists, however, such occurrences may be looked at in a different light. Nothing can be more harrowing to the nerves and sympathies of a driver than to be unwittingly the cause of the death of a fellow-creature, even when, as in the present instance, he is in no wise to blame. Suicide under any circumstances is legally a crime. Attempts at it, where they involve suffering and discomfiture to another person, ought, we are inclined to think, to be *specially* "dealt with" whenever the intending suicide survives.

THE SCOTTISH RELIABILITY TRIALS.

THE start of this competition took place on Wednesday, the 10th, and it concluded on Saturday last, the 13th inst., and proved to be not only a severe and genuine test of the reliability of touring vehicles, but a pleasant outing to all engaged in it, excepting, perhaps, a few drivers or owners whose misfortunes may have blinded them to the beautiful scenery and pleasant conditions.

The start was made from Blythswood Square, Glasgow, the route being by Coatbridge and Airdrie to Bathgate and Edinburgh. Punctual to the schedule time, and in presence of a large crowd of spectators, the first car—a 16-h.p. Albion—was sent on its way by Mr. John Adam, and at 20-second intervals the

other cars followed. All along the route out of Glasgow the progress of the cars was watched with interest by crowds

of people, and it may be said here, once for all, that the same state of things was found to exist throughout the journey. In every town and village there were numerous spectators, and from the numbers of children seen at every populous point it was apparent that in many cases a school holiday had been declared. When these bairns grow up they should have no prejudices against motor cars.

From Glasgow to Edinburgh on the modern automobile is a matter of but little moment, even the least powerful making light of it, but among the forty-three

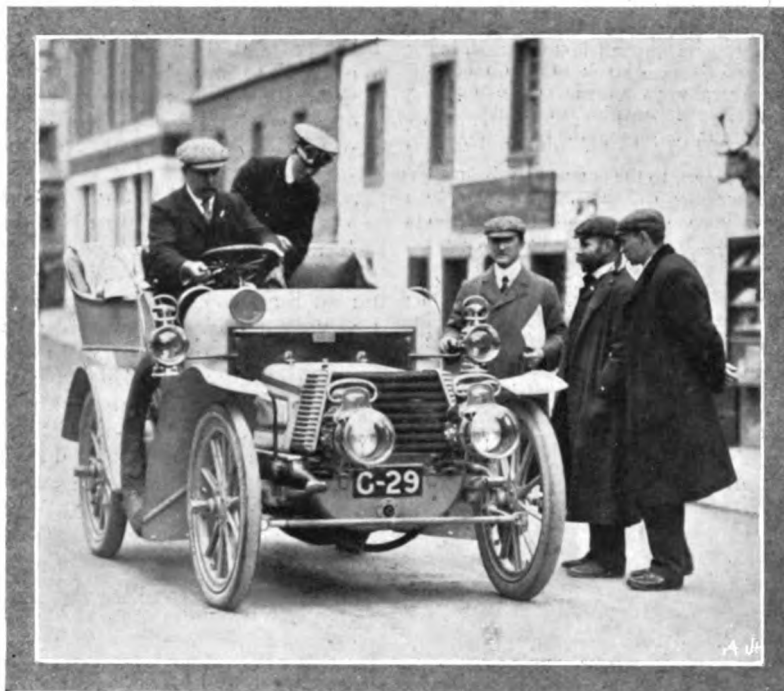


Photo by Argent Archer.

SCOTTISH RELIABILITY TRIALS.—Some of the officials in charge.



Photo by Argent Archer.

SCOTTISH RELIABILITY TRIALS.—On the weigh-bridge. The 8-h.p. De Dion Car, entered and driven by Miss Dorothy Levitt, who is at the wheel.



Photo by Argent Archer.

SCOTTISH RELIABILITY TRIALS.—General view of the starting point for the Cairnwell Hill Climb.

cars to start there was bound to be some trouble, and as we started near the end of the procession we were permitted to see the few victims of tyre trouble, for which no points were deducted, and others with the more serious annoyance of mechanical defects. An early victim was the Chenard and Walcker, which had

trouble with a sparking plug and a bad tyre delay, curiously enough the only stoppages during the whole journey; and as both occurred within a few miles of Glasgow, it may be said of this car that of the 595 miles, of which the trial consisted, it had a non-stop record over 590 miles. The Ariel, the 12-h.p. Darracq,



Photo by Argent Archer.

SCOTTISH RELIABILITY TRIALS.—The start for the Cairnwell Hill Climb and the "Devil's Elbow." The cars waiting their call. No. 24 is the 12-16-h.p. Richard-Brasier; No. 5 is the 16-20-h.p. Gladiator; No. 29, 15-h.p. Darracq; No. 13, 10-12-h.p. Argyll; No. 31, 8-h.p. Darracq; No. 6, 12-h.p. Sunbeam.

and the 10-h.p. Ford were all passed, engaged in the interesting work of tyre repair. As we progressed through the Black Country of Scotland, there were numerous speculations as to the reason for sending a motor car trial through such dismal surroundings, when so much pleasanter routes to Edinburgh existed. People who thus surmised and wondered, appeared to ignore the educative effect of a journey through a densely populated district, an object which the western section had no doubt in view when they selected the route.

By most of the cars, Edinburgh was reached well up to the minimum time, the Albion maintaining its position as leader, and before 1 o'clock most of the contestants were lined up round Charlotte Square, where they remained for 50 minutes for lunch, of which, however, 15 minutes might be occupied in replenishment of petrol and lubricator supplies. Leaving Edinburgh by the same road on which it was reached, the cars made for Stirling, the first of them passing through that ancient town about half-past three o'clock, the others following for more than an hour afterwards. At Edinburgh, Captain Deasy intimated that he did not propose going further, and he therefore withdrew his car, No. 38, the 30-40-h.p. Martini, from the trial, so that of the forty-three starters from Glasgow, only forty-two left Edinburgh. Up till the arrival of the first cars at Stirling, the weather had been bright and dry, the dust being, however, a good deal of a nuisance. Some rain which fell about this time, although it caused some discomfort, was, therefore, heartily welcomed by most, and it had the effect of rendering the rest of the day's journey more pleasant. From Stirling, then past the pleasantly-situated Bridge of Allan, on through Dunblane, in which there remains one of the few cathedrals left by the Reformation in Scotland, past the field of Sheriffmuir on the right, where the fortunes of the First Pretender were blighted in 1715, and over an undulating road of good surface to Perth. This fair city presented the usual crowd and hearty welcome, but the proffered hospitality could not be accepted; and passing through, between five and six o'clock, the cars proceeded along the beautiful road by Tay-side to Dundee, distant from Glasgow 136 miles. Here the first of the very few accidents occurring during the competition took place, and it, like the others, was fortunately of no serious consequence. While the leading cars were passing along High Street, a little girl ran out of the line of spectators, and was knocked down by the 14-h.p. Minerva, driven by Mr. Arnott. She was taken from under the car, and was found to have escaped with some bruises about the knees. About a quarter-past six o'clock, the Albion car drew up at the entrance to the Drill Hall in Dudhope Crescent just a few minutes over the minimum time of 7h. 20m., plus 50 minutes for lunch permitted between Glasgow and Dundee. It was not till well after eight o'clock, however, that the final arrival took place, and it was then found that all except the Martini had got through. There had been a good deal of tyre trouble, twelve of the cars having stoppages on that account; while eight had been stopped with mechanical trouble of one kind or other, nothing of a serious nature being involved however. Thirty-four cars out of forty-two were therefore entitled to non-stop certificates, although nine of them had been in trouble with tyres.

Thursday morning broke bright and fine, so that as the cars were lined up outside of the drill hall the scene was sufficiently stirring. A large crowd had gathered

notwithstanding the early hour—the start was at seven o'clock—to see the cars away, and the people proved something of an inconvenience. The first twenty cars to arrive the previous evening were sent away at seven o'clock and the remaining twenty-two at half-past seven. This was to permit of the first contingent getting up the first hill-climb before the second turned up, the object being, of course, to prevent unnecessary waiting at the foot of the hill. But “the best laid schemes, &c.,” as we shall see presently. After the first lot had been sent away, the remaining cars were placed in position in a yard within the drill hall precincts on account of the congested condition of the street outside. Two cars, a Ryknield and an Arrol-Johnston, were left behind, both suffering from defective water circulation, but they both started about half an hour after the others. The route was away by Coupar-Angus and Bhaigowrie, then by Bridge of Cally over good roads, and in fine clear weather, to the Spital of Glenshee, when the road began to deteriorate; but on went the cars, the lower-powered machines, however, finding some difficulty in maintaining position, with the result that when the first arrival reached the beginning of the hill-climb, about half-past nine, it was found to be one of the more powerful cars, the 24-h.p. Mors. This car went up soon after, but thereafter there was delay owing to a fault in the wire from the summit, and some time was spent in its detection. It has been stated that the delay was caused by the Mors breaking the tread-wire stretched across the road; but the reason mentioned is the correct one. This was the only occasion on which the arrangements did not give the best of results, and the trouble in this case could not have been foreseen. The hill-climb was 1,226 yards in length, with a gradient varying from 1 in 6.5 to 1 in 10, and an extremely nasty turn, named the Devil's Elbow, soon after the start. The surface was also very poor, so that the hill might be described as a severe test indeed. The cars were started at intervals of about five minutes, but, on account of the narrow road, no car was sent off until the one preceding it had reached the finish of the measured distance. There was, in addition to the telephone, which was ultimately used, a system of signalling by men at high points to indicate the passing of cars, and enable the succeeding one to start instantly. Most of the cars got up without help, but one or two had to be pushed and of the cars that finished the 12-h.p. De Dion dropped his mechanic, while the Vauxhall, after the first bend, dropped the observer and went up backwards. The best times over this stretch of rough road were made by the Daimler and the Germain with less than three minutes, the usual time taken being between four and six minutes. The run from the top of Cairnwell down to Braemar and on to Aberdeen was extremely enjoyable; fortunately, it was also uneventful, and the 68 miles to the garage for the night in Union Row, Aberdeen, was covered under the most pleasant conditions. The total distance for this day was 111 miles, and all the 42 cars to start from Dundee completed the distance, although the late arrivals were nearly six hours behind the first car. This was accounted for by the later start, and delays at the hill climb and on the road. An examination of results showed that the non-stop category was beginning to dwindle, as 26 only appeared to be entitled to that character over the two days.

Friday broke bright enough, but with a cold north-east wind blowing, and when the cars were lined up in the street for a start at seven o'clock there was more

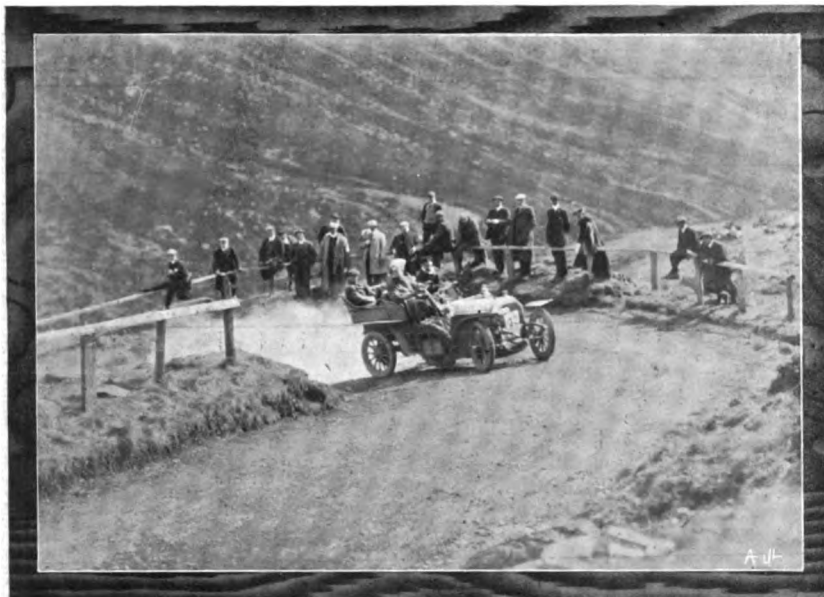


Photo by Argent Archer.

SCOTTISH RELIABILITY TRIALS.—The "hard nut" of the Trial. The 30-40-h.p. Belsize rounding the "Devil's Elbow" on the Cairnwell Hill Climb on the second day.

than one rueful visage apparent. A seven o'clock start means attendance by the observer at 6.20, consequently a half-past five o'clock breakfast. But motoring makes for early rising, and promptly at seven o'clock the first car, still the Mors, was sent away, the whole of the others following in rapid succession. The route was by Inverurie, Huntly, and Keith, Dufftown, Tomintoul, Grantown, and Kingussie to Pitlochry, a distance of 181 miles, and the longest of the four daily runs. Aberdeen had not been long left behind till the procession was reduced by one car, the 12-h.p. Darracq, No. 30, having apparently had enough, and it was not alone in misfortune before the day was old. No. 14, the 18-22-h.p. Argyll, had to be withdrawn as the result of an accident to the driving-shaft sustained the preceding day in Glenshee. In passing over a sharp peaked culvert the shaft is said to have got bent by touching the ground, and when, in the town of Huntly, the car stopped, it was found to have broken a pinion, as a consequence of the strain, and was, therefore, withdrawn. A more alarming accident than this, however, occurred only a few miles further on the road.

The Drummond car in going round a curve is said to have broken a steering-rod pin, and becoming uncontrollable ran into a bank, throwing out the three occupants of the tonneau. Two of them—the representative of the *Manchester Guardian* and a Newcastle gentleman—escaped with a shaking, but the observer, a Frenchman, Mr. Renauld Lage, was so cut about the head as to require medical attention and rest at Keith for the night.

Exit the Drummond. Meanwhile the occupants of the cars had been meeting with some specimens of weather, showers of rain and hail falling in the Huntly and Keith district; as these had the effect of laying the dust, only the lighter clad regretted them. After leaving Dufftown, the real Highland roads began, and these were experienced the greater part of the way back to Glasgow.

A true Highland road is never level and seldom straight. A fair but narrow surface is combined with one or other of the characteristics named, and when they are all found in one road, as at one point between Killin and Dalmally, then the motorist's joy is unalloyed. But to our tale. Up through Glenrines progressed the cars to Achbreck, and to hear the Southern attempts at the pronunciation of that first syllable was pleasing indeed to the guttural-speaking Scots.

Tomintoul to Grantown, in Strathspey, and luncheon was the next part of the journey, and any man who failed to do justice to the "Scotch" in that heart of the distillery district, deserved to want the beverage for all time. Fifty minutes later, the cars were away, following the track of the Highland Railway up over the ridge of the world, and down to Pitlochry and rest. Besides the cars already mentioned as having withdrawn, the St. Vincent failed to reach Pitlochry and was withdrawn. This car had experienced trouble with the clutch before reaching Aberdeen, and it is supposed similar trouble caused its withdrawal. Thirty-seven cars therefore reached Pitlochry, and twenty-one



Photo by Argent Archer.

SCOTTISH RELIABILITY TRIALS.—The 15-20 Brooke Tonneau reaching the summit of the Cairnwell Hill, on which the "Devil's Elbow" had to be negotiated.

No.	Description.	Wednesday, 10th May.			Thursday, 11th May.			Friday, 12th May.			Saturday, 13th May.			Entitled to Non-Stop Certificates.		Aggregate time in 2 hill-climbs.
		Stoppages : mechanical.		Tyres.	Mechanical.		Tyres.	Mechanical.		Tyres.	Mechanical.		Tyres.	Actual.	Virtual.*	
CLASS A.—Petrol Vehicles having One Cylinder.																
19	8-h.p. De Dion	N.S.	...	m.	N.S.	...	m.	N.S.	...	m.	N.S.	...	m.	N.S.	—	m. s.
26	10-h.p. Cadillac	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	—	29 10
31	8-h.p. Darracq	N.S.	...	17	Driving stop 1	...	44	N.S.	...	...	N.S.	...	...	N.S.	—	21 36½
36	6 h.p. Wolseley	—	...	17	—	...	44	—	...	...	N.S.	...	...	N.S.	—	28 56½
CLASS B.—Petrol Vehicles having Two Cylinders.																
1	16-h.p. Albion	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	—	17 33½
9	12-h.p. Arrol-Johnston	Water-connection 22	...	—	Water-connection 31, diving 1	...	31	N.S.	...	...	N.S.	...	...	N.S.	—	22 47
13	10-12-h.p. Argyll	Driving stop 1	...	—	N.S.	...	—	N.S.	...	33	Ignition 34, hill stop 3, driving stop 4	...	—	N.S.	—	24 11
18	12-h.p. Clement	—	...	18	Driving 1	...	—	Driving stop 1	...	71	N.S.	...	—	N.S.	—	25 27½
20	12-h.p. De Dion	...	...	43	Hill-stop 1	...	—	Trembler 4	...	—	Spkg. plug 2, hill stop 1	...	—	N.S.	—	21 38
27	10-h.p. Ford...	...	...	25	N.S.	...	3	N.S.	...	...	N.S.	...	...	N.S.	—	27 21½
30	12-h.p. Darracq	...	...	48	Driving stop 1	...	3	Withdrawn.	...	—	N.S.	...	...	N.S.	—	30 39½
37	14-h.p. Wolseley	...	...	—	N.S.	...	—	Throttle-valve 1	...	—	—	...	2	N.S.	—	16 33½
40	12-h.p. Gladiator	N.S.	...	—	N.S.	...	—	N.S.	...	—	Carburettor 7	...	—	N.S.	—	23 27½
CLASS C.—Petrol Vehicles having Three or more Cylinders.																
2	16-20-h.p. Beeston-Humber	N.S.	...	—	N.S.	...	—	N.S.	...	21	N.S.	...	—	N.S.	—	15 34½
3	8-10-h.p. 3-seated Humber	N.S.	...	—	N.S.	...	—	N.S.	...	—	Carburettor 7, radiator 1	...	37	N.S.	—	15 29
4	18-h.p. Chenard and Walcker	Changing plugs 17	...	75	N.S.	...	—	N.S.	...	—	Driving stop 4, broken chain 16	...	—	N.S.	—	16 7½
5	16-20-h.p. Gladiator	Ignition 3	...	10	Driving stop 1	...	—	N.S.	...	—	Engine over-heated 5	...	—	N.S.	—	20 56½
6	12-h.p. Sunbeam	N.S.	...	20	N.S.	...	—	Driving stop 1	...	—	N.S.	...	—	N.S.	—	21 32
7	18-h.p. Siddley	Choked carburettor 10	...	24	N.S.	...	—	Starting 1	...	—	N.S.	...	—	N.S.	—	14 38½
8	20-25-h.p. Ariel	—	...	—	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	—	13 51½
10	20-32-h.p. Mors	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	—	13 19½
11	14-h.p. Minerva	N.S.	...	—	N.S.	...	—	N.S.	...	19	Replenishing 5	...	—	N.S.	—	16 7½
12	12-h.p. Swift	N.S.	...	—	Steering-gear 1, driving stop 1	...	—	Radiator and ignition 37	...	—	—	...	4	N.S.	—	18 35
14	18-22-h.p. Argyll	N.S.	...	—	Carburettor 2	...	—	Withdrawn.	...	—	Driving stop 3	...	—	N.S.	—	16 46½
15	16-20-h.p. Argyll	N.S.	...	67	N.S.	...	21	Ignition 1	...	18	Silencer 99	...	—	N.S.	—	45 57½
16	30-h.p. Daimler	—	...	12	N.S.	...	—	Driving stop 1	...	—	Starting engine 9	...	—	N.S.	—	19 19½
17	16-h.p. Clement	...	...	—	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	—	13 34½
21	24-h.p. Germain	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	—	12 27½
22	24-h.p. Thornycroft	N.S.	...	—	N.S.	...	—	N.S.	...	—	Commutator 5	...	—	N.S.	—	20 48½
23	12-h.p. Pipe...	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	—	19 21½
24	12-h.p. Richard Brasier	Pump and water connection 15, sparking-plug 4	...	—	Petrol 5, pump 92, water 8, driving 1, ignition	...	1	N.S.	...	—	Plugs 9, water 1, hills 11	...	24	N.S.	—	18 52½
25	24-h.p. Rykfield	Throttle wire jammed 1	...	—	Commutator 3, clutch 28	...	—	N.S.	...	—	Withdrawn.	...	—	N.S.	—	17 51½
28	20-h.p. Ford..	...	...	—	N.S.	...	—	Petrol and water 44, carburettor 15	...	—	Withdrawn	...	—	N.S.	—	14 35½
29	15-h.p. Darracq	...	...	12	N.S.	...	—	N.S.	...	—	Withdrawn	...	—	N.S.	—	18 59
32	30-40-h.p. Belsize	...	...	—	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	—	37 15½
33	15-20-h.p. Brooke	...	...	—	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	—	—
34	24-30-h.p. Beaufort...	Did not start.	...	—	Ignition and carburettor	...	—	Ignition 192, water 14...	...	—	Water 130	...	—	N.S.	—	—
35	7-9-h.p. Vauxhall	Choked silencer 19	...	—	94	...	—	—	...	—	—	...	—	N.S.	—	—
38	30-40-h.p. Martini	Withdrawn at Edinburgh	...	—	Steering-gear 2, water 1, hill stop 2	...	—	Withdrawn.	...	—	N.S.	...	—	N.S.	—	14 29
39	20-24-h.p. Drummond	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	...	15	N.S.	—	16 41½
41	20-h.p. Vinot et Deguingand	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	—	18 56½
42	12-14-h.p. Gladiator	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	—	—
43	12-14-h.p. Argyll	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	...	—	N.S.	—	—
44	12-14-h.p. St. Vincent	N.S.	...	—	Clutch 51, ignition 2	...	—	Withdrawn.	...	—	Withdrawn.	...	—	N.S.	—	—

N.S. = non-stop. * Stoppages from tyre trouble did not disqualify the car for a non-stop certificate, but it has been considered advisable to distinguish between cars which performed actual non-stop runs, and those having tyre stops merely.

Of 44 cars entered 43 started, the non-starter being 24-30-h.p. Beaufort. Of the 43 starters, 7 withdrew for various reasons given in our description, and 36 returned to the garage appointed by the club in Glasgow, whence they departed on Wednesday morning.

The figures given above are subject to a final audit. The hill-climb aggregate time is, although having a bearing on the final results, do not necessarily decide the medal awards.

were found to be entitled to non-stop certificates for the three days, a very good percentage when the severity of the course is considered. After arrival, the 20-h.p. Ford was withdrawn, owing to radiator trouble.

On Saturday morning, only thirty-six cars left Pitlochry for the final run of 166 miles, including the hill-climb of Loch-na-Craig at Aberfeldy. This hill differs from the first in being longer but less steep. It is about $3\frac{1}{4}$ miles in length, with an average gradient of 1 in 17, and a variation from 1 in 10 to 1 in 50. The surface is fairly good, and the road so wide as to permit cars to pass. It was, therefore, decided to start them at three minutes' intervals, and in this manner the climb was accomplished by most of the cars without trouble. The Daimler, which had done so well on the first hill, had trouble with her silencer, a portion of which was blown out, and the exhaust getting at the carburettor caused a flare up, fortunately, however, without serious consequences. This is alleged to have been caused by neglect to use an es-



Photo by Argent Archer.
SCOTTISH RELIABILITY TRIALS.—Starting for Aberfeldy Hill Climb. In front is the 12-h.p. Swift, and No. 13 is the 10-12-h.p. Argyll, driven by the Hon. Mrs. Loder.

cape valve which is provided for safety in certain contingencies. From the top of Loch-na-Craig to Glasgow is a road full of hills, some of them extremely trying, but there are also many fine scenic effects, and the man who enjoys the delightful run from Crieff to Lochearnhead cannot grumble at the long pull up Glenogle or the abrupt drop into Glendochart, with the right-angle turn at the bottom. The run from that point to Dalmally is not what one would voluntarily select if a better road could be found, and the corkscrew from Tyndrum to Dalmally is a little trying after a sufficiently exacting journey, but it is a good test, and that was the object of the little trip. From Dalmally over to Inveraray is a climb up and a drop down, which may also be said of the subsequently traversed Glen Kinglas up to Rest and be Thankful, where, as one young man pathetically put it, some of the passengers would only have been too thankful for a chance of resting, rather than face the descent down Glen Croe to Arrochar. From Arrochar to Glasgow



Photo by Argent Archer.
SCOTTISH RELIABILITY TRIALS.—Waiting for the start for the Hill Climb at Aberfeldy on the last day. No. 26 is the 9-h.p. Cadillac, the next car the 12-14-h.p. Gladiator, and No. 36 the 6-h.p. Light Wolseley.

along by Loch Lomond was plain sailing, and the first of the cars reached the garage, whence they started on Wednesday morning very shortly after the expiration of the minimum time. Perhaps the most disgusted man to finish was Captain Banbury, driving the Mors, who, by missing a turning out of the city failed to come in first, an honour which his keenly alert, though withal careful driving, fully entitled him to. The first to arrive was the 14-h.p. Minerva, followed quickly by the 16-20-h.p. Argyll, the 24-h.p. Thornycroft, the 24-h.p. Germain, and so on. It was found that fifteen of the cars had come through the four days without mechanical stops, namely the 16-h.p. Albion, 16-h.p. Beeston Humber, 20-h.p. Ariel, 24-h.p. Mors, 8-h.p. De Dion, 24-h.p. Germain, 24-h.p. Thornycroft, 12-h.p. Richard-Brasier, 9-h.p. Cadillac, 30-h.p. Belsize, 15-h.p. Brooke, 6-h.p. Wolseley, 20-h.p. Vinot and Deguingand, 12-h.p. Gladiator (No. 42), and the 12-h.p. Argyll. Considerable time was occupied after the arrival of the cars in measuring their petrol consumption, which is an important factor in deciding the relative value of the non-stop performances.

The arrangements throughout the trials were of the most satisfactory nature, and the committee of the

Western Section, but especially Mr. R. J. Smith, the honorary secretary, and his energetic henchman for the nonce, Mr. Adam, the chairman, deserve the very highest credit for the manner in which every possible contingency had been foreseen and provided for. It is no small matter to conduct such a trial through some of the most deserted parts of Scotland, and to provide housing and supplies for some forty cars and a hundred and fifty passengers. That this was accomplished without a hitch and without complaint redounds largely to the credit of Mr. Smith, on whom most of the organising and arrangements devolved. The following officials assisted in the honorary labours:—Timekeepers, Glen-shee: start, Mr. J. Davidson, checked by Mr. H. M. Napier; finish, Mr. Brownrigg, checked by Mr. J. M. Inglis. Aberfeldy: start, Mr. Davidson, checked by Mr. Napier; finish, Mr. H. Swindley, checked by Mr. Brown, with whom were Messrs. J. M. Ross and W. M. Weir; marshals were Messrs. John Adam, J. R. Smith, at the stopping places each night, assisted by Mr. Hugh Kennedy and others. At luncheon stops, Messrs. Cramp and Crosbie; stewards at hill-climbs, Messrs. J. R. Nisbet, J. M. Ross, Shanks, Napier, J. H. Steen, Downie, and Seligmann.



Photo by Argent Archer.

SCOTTISH RELIABILITY TRIALS.—The 24-h.p. Thornycroft coming into Pitlochrie, on the Friday.



WE are glad to find that the principle for which we and the Roads Improvement Association have for a long time been contending, viz., that one of the most important projects for the relief of London traffic is to widen the principal main roads in and out of the Metropolis, is being seriously considered by the Middlesex County Council, and that they have even gone the length of considering the necessity of applying for Parliamentary powers for the purpose. Such a scheme carried out on any scale would, of course, involve an enormous expenditure of money, but it will have to be done sooner or later, and we are glad to chronicle the first indication of an attempt to consider the subject seriously.

THE Essex Beaumont Motor Club deserve recognition for having devised quite a novel form of automobile sport, which, under circumstances, may be almost as interesting and quite as amusing as any form of racing. A 10-mile course, consisting of five miles out and back, was arranged, and the competitors were set to do it as nearly as possible in a certain fixed time, which might be either 32m. or 40m., according to their individual selection. Most of the competitors were distinctly wide of the mark in their estimate, the winner only coming within some 3m. 17s. of the time allotted to him, while the worst of the competitors was some 6m. 40s. out or the 40-m. allowance.

THE CRUISE OF NAPIER MAJOR.

IN view of the Mediterranean motor boat fiasco, Mr. S. F. Edge is naturally more than ever delighted with the cruise of Napier Major. The boat is now on her return journey, which will occupy a considerable length of time, as most of the ports *en route* will be called at. Thus, on May 11th, the start for the journey back was made from Lerwick, where the voyagers had a great send-off, accompanied by rockets, &c., and the same day they arrived at Stromness, in which upwards of 500 fishing boats were assembled. A meeting of skippers, to welcome the motor boatists, was held, and great enthusiasm prevailed. The wind and atmospheric conditions prevailing on the run from Lerwick to Stromness were exceedingly trying. On the 12th inst. Wick was reached, and the Pentland Firth was subsequently crossed. A tremendous sea was running, the boat and engine behaving splendidly.

Hence the course was directed to Inverness by way of Invergordon, which latter point was reached on the night of May 13th. Inverness itself being made at 12.32 p.m. on the 15th, while at Invergordon the travellers visited the cruiser squadron of the fleet, which had arrived the previous day.

All this goes to show that the seaworthy characteristics and general reliability displayed by Napier Major on the run north are being fully maintained on the return journey. This in itself forms a testimonial to the abilities of British boat and motor builders, which requires no further addition.

As our readers are aware, the northward cruise was carried out in the teeth of exceedingly trying weather, at times amounting to a regular storm. Much interest will be excited, therefore, by the fresh and breezy account of the voyage which has been written by Mr. A. F. Evans, the captain of the boat, in the form of a letter to Mr. S. F. Edge. The description, though obviously put together in haste, has all the salt and freshness of the sea, and we have, therefore, carefully refrained from altering any of the language, but have reproduced the most attractive passages word for word. It will be seen from the plain, unvarnished, but thoroughly realistic description how much of the romance of the sea a motor boat voyage of this kind may possess. The fact also emerges with marked clearness that considerable demands were made upon the physical endurance and readiness of resource in emergency of the captain and crew, and even at times, too, on their physical courage. The voyage is in marked contrast to the fiasco which we unfortunately have to record this week in connection with the Algiers-Toulon race.

Motor Yacht Napier Major.

If the hearty send-off that I had on April 20th at 2 o'clock at the Temple Pier had, or was to have, anything to do with our little voyage, our start was most auspicious. I was also extremely pleased to find that practically all the barge hands, wharf men, &c., as we went down the river were fully aware of the circumstances, and recognised the boat. In one instance a man held up an illustration of the boat and so on, all going merrily till we reached the Lower Hope, and turned into Sea Reach. Here we had it fully demonstrated what we were to expect, and by the time the Maplin Light was reached (about five past 7) it was obvious that the Swin was out of the question that night, so I put back into Hole Haven to await the morn.

Daylight brought no improvement in the weather; in fact, just the reverse, but it brought in a few barges, with their sails torn, and full of reports as to the quality of the weather outside. The

wind kept N.E. without a flicker, and the glass was high, but at last there was a slight swing round of the vane to the N., and at 2.30 in the morning we were away with just a breeze from the N.W. Daylight put out the Mouse Light, and we ran past the N. Gunfleet, Shipwash, Orford Ness, and so at 3 o'clock we were searching the vicinity of Lowestoft for the motor launch that was to meet us with the mizzen mast that we hoped he had for us. As there was no sign of Miller, or the motor, or the mast, I ran into the harbour, and up to a berth near his yard, and found him just starting out, as he had timed our arrival for 5 at the earliest.

Leaving the motor running, I abandoned the idea of fixing the mast at sea, and so a start was made, and eventually a fine job was made of it, and I felt that we were better prepared to ride out bad weather than we were before, as, with the sea anchor out ahead and the mizzen sheeted home, she should stand to anything.

There was no sign of daylight as in the latter part of the middle watch Hearman took hold of her outside the Heads, and we slipped along the Sands towards Yarmouth.

Our course took us to the Dudgeon Light, right in the entrance of the Wash, and in a direct line for Flamborough Head, with the wind all round the compass, and we dodged along, Hearman and Blythe taking one watch, and the boy and myself the other. I do not mean that one was in the engine room and one at the tiller all the time, for it was trick and trick about, but perhaps I had better give you a *resumé* of a normal day's working.

This should start at noon, and we will say that it is my watch. I would take the tiller, and the boy would get the dinner ready, clean the potatoes, slice up the dried haddock or salt cod and spread the oilcloth table cover, etc. In this he would be helped by Blythe, and by one bell, or one o'clock, dinner would be ready. The boy would now take the tiller, and I should go down to dinner, and, when finished, the poor boy would do the best he could with what remained and then wash up. All this time, Hearman would be writing up the log, or his journal, or pottering about with a chart, and Blythe, if he had not a job in hand, would go to sleep. Four o'clock brings the first dog watch, and Hearman and Blythe take hold, and I have two hours to do what I require, lay out a course, study the tides, and book up on the slate the lights that will have to be picked up during the night and the various courses and distances. At six I come on again, and keep on till eight, and Blythe in due course will bring up some tea and biscuits and everything would be snuggled down for the night. At eight Hearman goes on, and the boy and myself go below and turn in till twelve, when we are on deck again for the middle watch till four.

Hearman would take the morning watch and would rouse us out at eight. However, instead of coming right on, someone gets breakfast, and then it is scrub down decks, make beds, clean up the cabin and engine room, and all the odd jobs that are about, and so on, till noon. I may as well tell you, however, that we have only had one full normal day during the whole trip. Off Spurn Head, and about 20 miles away, a trawler altered her course and came alongside us, as he had heard of the boat, and wanted to speak to us and see what we were like. Off Flamborough, we came through the middle of a fleet of trawlers, and I cannot say with any truth that they looked much like torpedo boats even under the circumstances, for the lights they burn are quite distinctive. The Whitby light was struggling with the dawn as I came on deck on the 26th, and a haze coming up we lost sight of the land, but as I wanted to run inside Farn Island, I stood in for Tynemouth, and picked up the Heads. They looked very substantial, and somehow, there is a totally different look at these "Northern Coal Ports," bleak and dingy and grey, and the coast line and distant townships were cheerless in every way. The only saving clause was the quantity of shipping that was entering or leaving the harbour, which spoke of the amount of business inside. Coquet Island, with the town of Warkworth inside, was interesting, but more so was Farn Island and the little rugged town of N. Sunderland, and there was an old world-look about Holy Island with its ancient castle. Then came Berwick, where we stepped across the border, and I shaped a course for Aberdeen, and turned in.

It was my watch below at nine, and just as I was getting to sleep, I thought I heard a steamer whistle, but as they did not blow again immediately I thought that it could not be. However, I was not to remain in blissful ignorance for long for our tin trumpet spoke out, and by the time I had fallen out of my bunk there was a tremendous roar alongside, and I was just in time to see the lights or rather headlights of a steamer pass close by us and disappear astern on our port side. It turned out that she had blown right ahead and Hearman had just managed to twist her out from under

our bows. It was very thick and cold and we stood on, blowing the horn at intervals.

The morning broke cold, hazy, and bad, with a lot of wind from the N.E., with a promise of more to come, and the sea which was running very true gave us no trouble, but Mr. Pilot assured me that we would not hold a true sea very long, though he did not think the wind would increase. The weather, however, did not moderate but on the contrary, the wind increased till it was blowing a moderate gale by the time that we were within ten miles of Fair Isle by the log, and then it came in quite a full gale and the sea was running very high and very hard, without running quite true. We were making about four knots an hour against it, and under the existing conditions could have carried on for any reasonable time. I had better explain that the sea is affected both by Fair Isle and Sumburgh Head, and there is formed what is termed a Rost, which in bad weather extends over the whole district and makes what is certainly a very dangerous piece of water. It is a sort of glorified Portland Race, and I doubt if any boat of our size would live in it in bad weather. However, everything would have been all right if the weather had been clear, but it was so thick that land could not have been made out a mile off, and after we had run our distance by log, that would have fetched Fair Isle, we cruised around in hopes of picking up the land, which would have given me a fair course to the west of Sumburgh for the time. Not being able to pick up the land left me two alternatives—to run for shelter or to lay to and wait for better weather. I consulted with the pilot, and suggested the latter course, but he would not hear of it, as he said the position we were in was too dangerous for us to risk a storm, and, after waiting about some little time longer, I shaped a course for the Auskerry Light, to the N.E. of the Orkneys. I assumed that we were at Fair Isle, and the course and distance had just been run when we picked up Auskerry, so that we were close to Fair Isle when we turned; in fact, we were two miles off. There was, of course, a big following sea as we ran, and I was very pleased with the way the boat ran before it; she did not show any tendency to yaw, and, although some of the breaking seas managed to climb over aft, there was nothing reached the cockpit, and she was never for a moment out of hand.

We were soon in calm water in the lee of the Islands, and poked round in the dark to find a snug berth, and finally anchored just at the back of a little spit that formed a snug haven.

Two black things moving round excited my interest, and they proved to be seals, we saw several during our stay on the Islands, but there seem to be no steps taken to secure them on the part of the inhabitants. "Stronsay Papa" was just round the point, and though the wind had dropped the fog was thick, and I found it impossible to go on to Shetland, so crept in to Stronsay "by guess and lead" to find that they knew all about it, the news had been carried across the Island and the whole of it were lined up on the pier. I got the bedding ashore to the little hotel, and had it dried, and ordered dinner, and then came the order to repel boarders, for

of course there was not one able to crawl aboard to see the engine who did not want to do so, and there are a good many level-headed men in Stronsay, it was a pleasure to talk to them. One, Mr. Leslie, took me in hand, and insisted on my taking my cue from him as far as getting away was concerned, but as day after day brought bad weather, I decided to run down to Kirkwall. Saturday we arrived, Sunday was spent in peace, and on Monday, I, under the guidance of Leslie, ran to Kirkwall. Now, I do not recommend anyone to take a boat through the Orkneys without a local pilot, it abounds with dangers, and the tides are funny, and though I am sorry to say I was guilty of bringing her through at night, I would not use it as a cruising ground myself unless compelled.

Kirkwall of course knew all about us and made a great deal of fuss, the motor car of the islands being placed at our disposal. We arrived at Stronsay mid-day and arranged to leave at three the next morning. Three o'clock came with more wind than ever, but it was its last effort, for at eight Leslie brought some milk and said that he wanted to speak to me after breakfast. Now, says Leslie, if you want to do the best thing, you get away at eleven and you will have the ebb to help you to make Fair Isle, and you must wait there the flood and you will get a good tide for Sumburgh Rost. Five of them came on board as we started, towing their boat astern, just to show us the way out, they said, and a more hearty send off I have never had, and it is my regret that I did not get a photograph of them as they stood in their trim little craft cheering till the last, and my fingers ache at the thoughts of the parting. Honest and hard and a brave set of men are the fishermen of these Islands.

The worst bit of sea around the English coast, they are proud of telling you, is that which lies between the Orkneys and Shetlands, and yet it was the only run that we have had that has been in any way decent—a light breeze to just fill our little rags, not much swell, and a lovely day, and what little of the Rost we found was nothing, just sufficient to show what it could be like. Fair Isle was picked up, with the Orkneys in sight, and Leslie had wired to Mr. Stout to show us in, and sure enough, out of a cluster of Skerries, a boat darted out at a great speed, and reminded one of certain tales of one's youth, where wreckers and pirates figured largely.

Measured of speech were these islanders, and we were made welcome. After turning and dodging amongst the Skerries, taking directions for the outward passage, we ran in and let go in four fathoms of crystal water with a wealth of curious seaweed. Hearman and myself went ashore and interviewed the inhabitants and showed them the boat, they in turn took us to the top of a hill that overlooked an awesome fiord and pointed out where a ship had come ashore here and a fishing boat cast up there, and other cheerful items.

P.S.—I have, I find, not told you that through the whole of this run no trouble of any sort has arisen with the engine and she has never given a moment's anxiety.—A. F. E.



AERONAUTICS.

THE attention of aeronautical circles in Paris, and for that matter the world generally, is at present concentrated on the experiments of the two Messrs. Dufaux, who have been demonstrating in the grounds of the Aero Club, at St. Cloud, the ascensional powers of the machine which has been termed a helicoptere (this being presumably intended to signify a screw wing from *πτερος* and helix). The Dufaux apparatus consists of a light tubular framework, 5 metres from end to end; at each end is mounted a pair of propellers constructed of parchment stretched on wooden frames. The propellers revolve in opposite directions, being driven by propeller-shafts and bevel gearing from a petrol motor mounted vertically amidships, and developing a little over 3-h.p. The weight of the motor which, it will be seen, is of remarkable lightness, amounts to only 4½ kilogs., the total weight of the helicoptere, everything included, being 17 kilogs. The ascensional powers of the machine were demonstrated by attaching it to an endless rope passing over two pulleys, one near the ground and the other near the roof of the Aero Club shed, some 90 feet above. On starting the engine, the

machine quickly rose to the top of its travel, and proved itself capable of carrying up with it an additional weight of 6 kilogs. The Dufaux machine is interesting on account principally of the lightness of the motor with which it is equipped, though it must be recollected that the principle is not new, except in the manner of its execution, the ascensional powers of vertically lifting propellers being well known and universally recognised. The experiments confirm what we have always maintained in these columns, viz., that though it is possible to go up in the air in this manner, the method is an expensive way of rising in the world. With an aeroplane constructed on the Wright or Chanute principle, some 50 lbs., say 20 kilogs., can be raised or sustained per horse power; here we have 3 horse power only succeeding in lifting a total weight of some 52 lbs. in all. As far as mechanical efficiency, therefore, is concerned, it is clear that the Dufaux apparatus does not differ essentially from other vertical propeller machines, though how far it can be made more efficient, and whether it will prove easier to control in the air than machines of the aeroplane type only time and experience will enable us to ascertain.

INDEX

THE POLLARD COMPOUND PETROL ENGINE.

It is no new idea to attempt to obtain more power and greater economy from an internal combustion engine by leading the exhaust-gases into another working cylinder before allowing them to escape to the atmosphere, for, after all, this is merely to follow the ordinary and highly advantageous practice that is adopted for compound steam engines. Unfortunately for the equal success of this scheme, however, the exhaust-gases are of an entirely different character to the exhaust steam from a steam engine, for they expand to their full extent extremely rapidly, and their pressure falls without anything like so great an increase in volume. It is, nevertheless, quite possible to obtain a perceptible increase in power by making use of them, although it is highly probable that any commercially successful compound petrol engine must differ

the explosion cylinder. In these engines, therefore, the working stroke of the low-pressure cylinder corresponds exactly, in point of time (phase), with the exhaust stroke of the high-pressure cylinder, and, since the two cylinders are then in open communication with one another, the piston in the latter works *against* exactly the same pressure (per square inch) as operates in the former, and the additional amount of useful work actually done on the crank-shaft depends merely upon the difference in area of the two pistons (assuming the stroke to be the same). The work has not, therefore, been done immediately, nor has it been possible to prevent the gases from coming into contact with a large cooling surface, while a further essential and serious drawback has been that a considerable proportion of the additional power obtained has, at

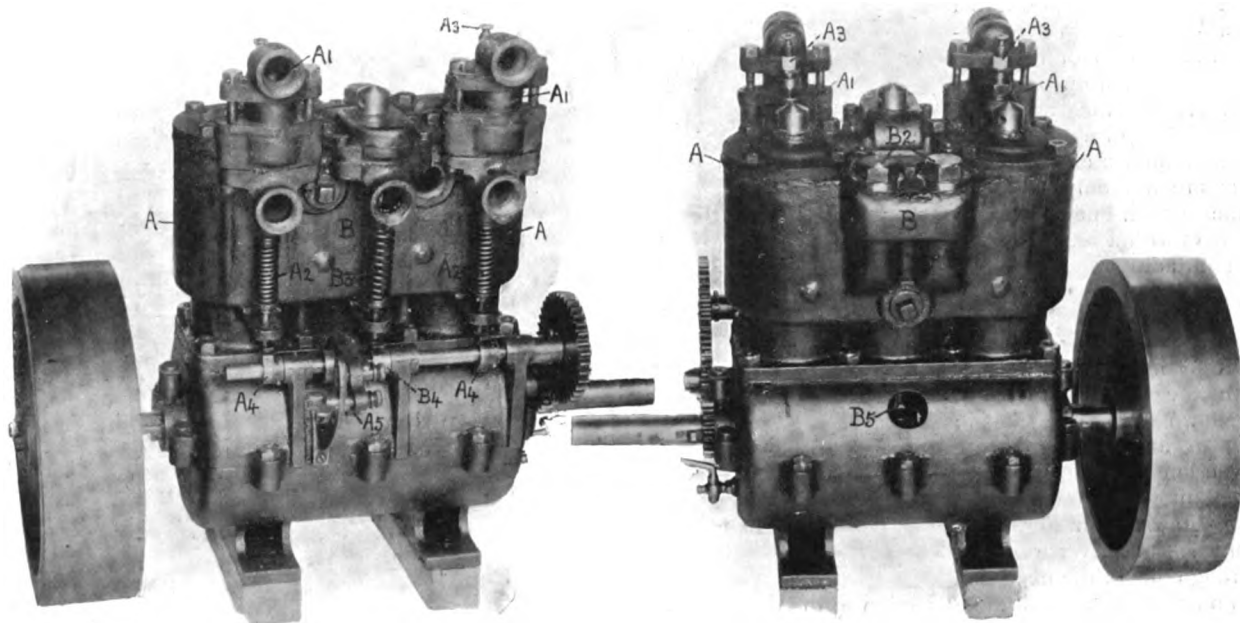


Fig. 1.—Two views of the Pollard Compound Petrol Engine.

radically in arrangement from a compound steam engine, and that it must utilise the exhaust-gases in quite a different way. Bearing in mind that, although the gases are at a considerable pressure in the explosion cylinder at the end of the firing stroke, they lose their pressure rapidly if allowed to remain in contact with the walls of the cylinder, or to pass into a larger chamber, it will be realised that they should be made to immediately perform what work they can, and that they should be prevented from coming into contact with a greater surface of the relatively cool cylinder casting than is absolutely necessary.

Previous Attempts at Compounding.

Hitherto, such compound engines as have been constructed—leaving out of consideration the numerous two-stroke examples—have followed steam-engine practice, and the whole of the exhaust-gases from the explosion cylinder or cylinders have been led into a much larger low-pressure cylinder, in which they have been required to do work on the piston during the entire exhaust-stroke of

the same time, been lost in overcoming the friction of the large piston in the low-pressure cylinder.

Possibly the work carried out in this direction by Mr. Edward Butler, M.I.M.E.—who has been one of the most enterprising of our English automobile pioneers—is as instructive as any. His experiments with compound petrol engines of this kind show that the power derivable from a two-cylinder engine may be increased by something like 10 per cent. (in certain types of engine, he claims to have obtained a 30 per cent. gain) if a low-pressure cylinder is added to it. But he also found that the pistons and exhaust-valves of the high-pressure cylinders were apt to become over-heated, and that there were other minor difficulties which practically precluded the application of that particular system to multi-cylinder high-speed engines.

The Principle of the Pollard Engine.

The Pollard engine, of which we are now able to give some particulars and illustrations, is designed on a very different principle from those that have previously come

before our notice, and therefore the comparative failure—from a commercial point of view—of compound engines in the past must not be taken as necessarily having any direct bearing upon it. In this engine, no attempt is made to compel the whole of the exhaust-gases to enter the low-pressure cylinder, and that cylinder is—in the engine which we have inspected—the same size as each of the two explosion cylinders. It is only the first rush of exhaust-gas, at the end of the firing-strokes, that is admitted, and the remainder of the products of combustion are expelled from the explosion cylinders to the atmosphere in the usual way. The experimental engine already constructed clearly shows, from the tests that we have witnessed, that additional power is obtained by the use of the low-pressure cylinder, but we shall have to await further developments—and the construction of other models—before it will be possible to obtain exact data showing the precise gain. What is evident, however, is that less of the additional power is wasted in overcoming the friction of the comparatively small low-pressure piston, that the gases are made to perform their work more immediately, and that they are not only given less time to cool, but come into contact with a reduced cooling surface.

The Construction of the Engine.

Referring to our illustrations, the engine already built is shown from both sides in Fig. 1, and, in Fig. 2, are given line drawings showing the internal construction. The drawings in Fig. 2 include (1) a transverse section through one of the explosion cylinders; (2) a longitudinal section of the engine, with part of one cylinder in elevation; and (3) a plan, half-sectional. The photographic reproductions correspond with the line drawings except so far as the induction-valves, A¹, are concerned, but it should be pointed out that in the one case these valves are placed above the exhaust-valves, A², and, in the other case, they are shown on the opposite side of the cylinders.

The engine has three cylinders of equal size, placed in line with one another immediately above the crank-shaft, and the two outer cylinders, A, are precisely similar in arrangement and action to those of an ordinary petrol engine. They operate on the "Otto" cycle, have atmospheric inlet-valves, A¹, cam-actuated exhaust-valves, A², high-tension ignition-plugs, A³, and the two crank-pins, with which the connecting-rods, A⁶, engage, are arranged in line with one another. These two cylinders work alternately, and thus the crank-shaft receives an impulse at the same moment during each revolution. The exhaust-valves, A², are, as usual, controlled by cams, A⁴, on a half-speed cam-shaft, and the commutator, A⁵—for the ignition system—is also mounted on the same shaft. Although this particular engine has atmospheric inlet-valves, yet mechanically-operated valves could be employed instead, without interfering with any of the proper functions of the engine.

The central cylinder, B, has the same bore and stroke as the explosion-cylinders, A, though it is unknown as yet whether or not the very best results are obtained by making it this size. It is provided with two admission-valves, B¹, on the one side, and with an ordinary exhaust-valve, B³, on the other side, the former merely being automatic "non-return" valves through which the exhaust-gases are admitted to the cylinder, and the latter being actuated by the cam, B⁴, on the ordinary half-speed shaft; the cam, B⁴, has two projections instead of one, and therefore it opens the valve, B³, during both the up-strokes of the low-pressure piston.

The passage of the exhaust-gases from the two explosion cylinders, A, into the top of the cylinder, B, are primarily controlled by the high-pressure pistons, which are arranged so as to uncover ports, C, which are cut in the cylinder walls. These ports are uncovered when the pistons are approaching the end of their downward

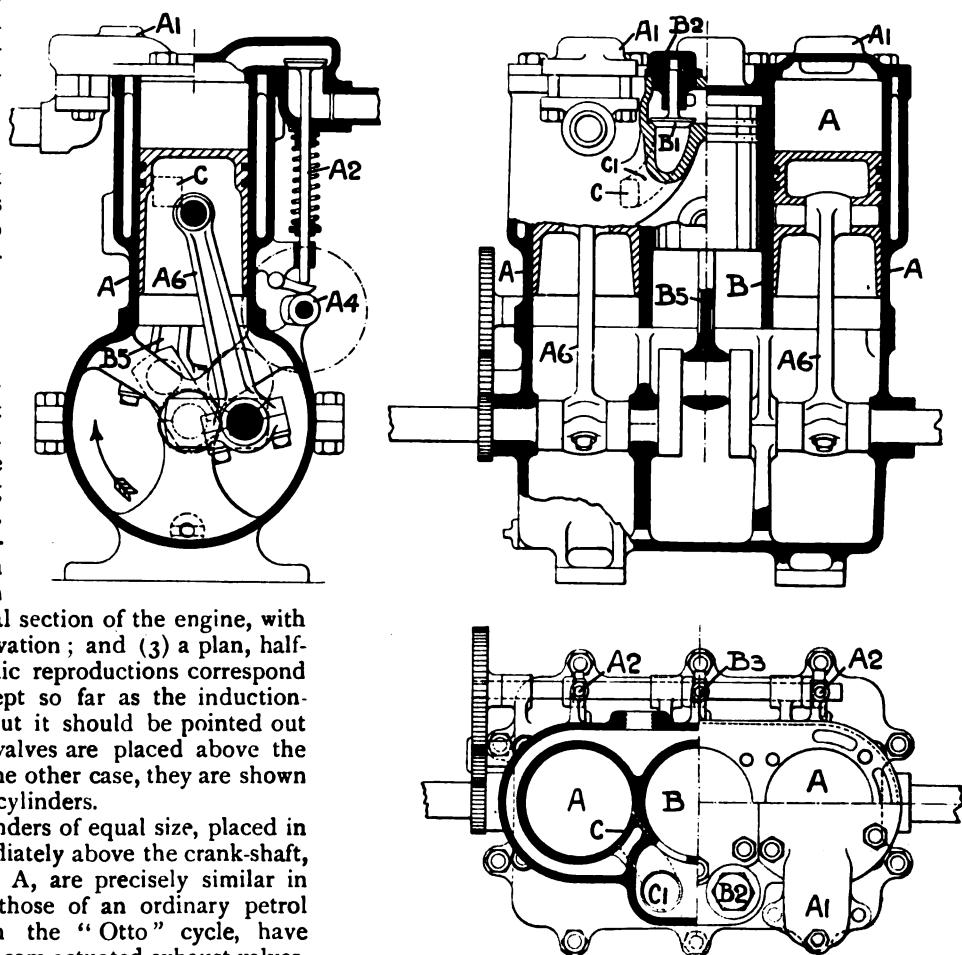


Fig. 2.—The Pollard Compound Petrol Engine. Transverse Section through one of the Explosion Cylinders, Longitudinal Section (part in elevation), and Plan (half-sectional).

strokes, and are, of course, again covered soon after the pistons have commenced their upward strokes. The ports, C, communicate with the valves, B¹, through passages, C¹—formed in the cylinder casting—and the valves, B¹, are rendered accessible for inspection by the plugs, B², that are arranged as guides above them. The connecting-rod, B⁵, for the low-pressure piston acts upon

a crank-pin, which is set, as seen in Fig. 2, at such an angle with the high-pressure crank-pins that its piston fits close up against the cylinder head, at just about the time that the other pistons are uncovering the ports, C.

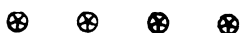
By this construction, the exhaust-gases are allowed to pass alternately from the two high-pressure cylinders, A, during the last portion of their firing strokes, and the first portion of their exhaust strokes, into the low-pressure cylinder, so that the gases act upon the low-pressure piston—which is then at the top of its stroke—and cause it to do useful work upon the crank-shaft. The remainder of the burnt gases in the explosion cylinders are then expelled into the atmosphere (through the valves, A²) by their pistons, in the usual way, and the gases which found their way into the other cylinder are subsequently forced out through the exhaust-valve, B², into the same exhaust pipe. It will be noticed that the valves, B¹, prevent any of the gases from returning to the explosion cylinders during the suction strokes, as they otherwise would do, and it will of course be realised that there is practically no clearance space behind the piston in the low-pressure cylinder.

The Prospects of the New Engine.

Although, as we have already said, the Pollard engine is at present in an insufficiently advanced state of development to enable any definite opinion to be formed concerning its commercial value from the motorist's point of view, yet, in addition to the advantages which we have mentioned above, it possesses several others to

which attention may be drawn. In common with all compound petrol engines, the noise of the exhaust is so reduced as to render unnecessary the use of a silencer for ordinary purposes, while, from the point of view of cost of construction and of reliability, it may be added that the various parts are all of a simple nature and do not materially complicate the machine. Apparently, moreover, there is absolutely no risk of the same trouble arising that was met with in Mr. Butler's engines through overheating of the high-pressure pistons and the exhaust-valves, for the tendency is—if anything—for these parts to be cooler than in an ordinary petrol engine.

One of the chief reasons why reliable data are as yet unavailable concerning the relative efficiency and output of the new engine is that there are several points which have yet to be ascertained, these including such matters as the relative sizes of the cylinders, the best setting of the crank-pins, and the most effective position of the ports, C. The final results also depend, in no small measure, upon the actual design of the standard types, since care has to be taken to obtain a proper balance of the moving parts and to reduce as far as possible the cubic capacity of the passages leading to the low-pressure cylinder. The Pollard engine at any rate overcomes many previous difficulties that have been met with in the design of a compound petrol engine, and the invention may well prove to be an important step in the development of such engines. For our own part, we shall watch the progress of this system with very great interest.



FRENCH PROGRESS.

THE French Government has recently promulgated a publication relating to the growth of the French automobile industry during the past few years. The statistics are arranged so as to enable the increased manufacture of commercial, automobiles to be distinguished from the output of pleasure cars. In both, however, the continuous growth since 1899, the first year with which the statistics deal, has been equally remarkable. In 1899, the total number of private motor cars manufactured in France was, according to the statistics, some 1,438. Since that year the output has increased almost in an arithmetical progression, and last year chronicled a splendid output of 12,519 private cars, with a total estimated horse-power of 92,612. During the same period the commercial automobiles have increased from 234 manufactured in 1899, to 11,235 manufactured in 1904.

Assuming the average price of private, *i.e.*, touring, cars at £300 each—a reasonable estimate—the private car manufacture for France alone represents a yearly output of well over 3½ millions. How important the export industry of automobiles is to France, a large proportion of which trade is done with this country, is also illustrated by the fact that for 1904 the exports of automobiles that is to all intents and purposes the excess of manufacture over and above the requirements of the home market amounted to 71,302,000 francs, or getting on for £3,000,000. In other words, out of every four motor cars built in France, approximately three go abroad, two probably finding their way to the United Kingdom. No wonder French politicians and diplomatists are anxious to maintain the *entente cordiale*.

The figures for the different years for the two principal classes of self-propelled vehicles are as follows:—

Number manufactured.				
Year.	To seat—		Total.	H.-P.
	More than two.	One or two.		
<i>Private Cars.</i>				
1899	818	620	1,438	—
1900	1,399	955	2,354	—
1901	2,472	1,955	4,427	22,415
1902	4,815	2,543	7,358	39,314
1903	7,228	2,694	9,922	61,526
1904	9,675	2,844	12,519	92,612
Total ...	26,407	11,611	38,018	215,867
<i>Business Cars.</i>				
1899	128	106	234	—
1900	239	304	543	—
1901	421	538	959	4,012
1902	988	861	1,849	8,263
1903	1,907	1,155	3,062	15,960
1904	3,038	1,550	4,588	28,307
Total ...	6,721	7,514	11,235	56,542

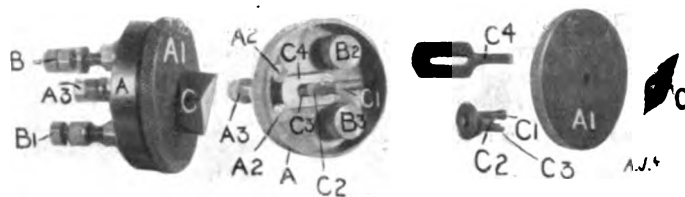
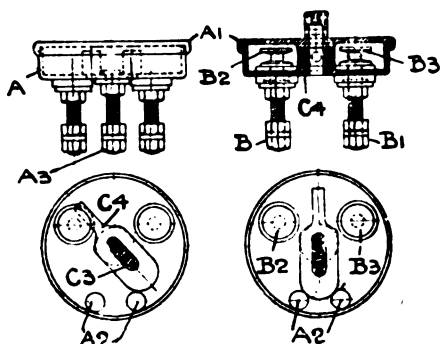
During the same period the exports and—what is, perhaps, more significant—the excess of exports over imports has gone up in like proportion, as shown by the following table:—

Years.	Exports.	Imports.	Excess of Exports.
	Francs.	Francs.	Francs.
1899	4,259,000	473,000	3,786,000
1900	9,417,000	517,000	8,900,000
1901	15,782,000	676,000	15,106,000
1902	30,219,000	1,068,000	29,151,000
1903	50,837,000	1,267,000	49,570,000
1904	71,302,000	3,835,000	67,467,000
Total	181,816,000	7,836,000	173,980,000

A NEW TWO-WAY SWITCH FOR MOTOR CARS.

A VERY ingenious form of switch, especially designed for use on motor cars, has just been put on the market by Messrs. Brown and Barlow. The switch complete, and also its component parts, are shown in the accompanying illustrations, of which Fig. 1 shows photographic views of the device and Fig. 2 a line drawing showing the switch in its "on" and "off" positions. With the exception of the insulating brushes, which protect the

The switch mechanism is of particularly ingenious construction, the shape of the switch-bar, C^1 , is clearly indicated in the illustration, and when in place on the spindle, C^1 , it fits over a small crank, C^2 , which is solid with the spindle, C^1 . In this position the bar, C^1 , can slide longitudinally to a certain extent, but it is also controlled by a small spring, C^3 . The spindle is carried by bearings in the case and the screw-cap, and it is operated by a small lozenge-shaped handle, C . In the "off" position the switch-bar, C^1 , rests between the two metal stops, A^2 , and it is prevented from moving by the curvature on that end of the switch-bar, C^1 , and the action of the spring, C^3 . By rotating the handle, C , however, the switch-bar may be forced over either of the



THE BROWN AND BARLOW TWO-WAY SWITCH.—On the left is a drawing illustrating the action of the switch, while on the right are views showing the apparatus complete and also dismantled. A , metal case; A^1 , screw cap; A^2 , stops; A^3 , "earth" terminal; B and B^1 , "live" terminals; B^2 and B^3 , contacts on B and B^1 ; C , switch handle; C^1 , spindle; C^2 , crank on C^1 ; C^3 , spring; C^4 , contact arm.

live terminals, the switch is constructed entirely of metal and is made, as nearly as possible, entirely watertight. The contacts are enclosed in a circular metal case, A , which is provided with a screw cap, A^1 . Three long terminal screws, A^3 , B , and B^1 , are fitted into the back of the case, A , and these serve as a fixing for the switch as well as connections for the wires. Of these three terminals, A^3 , which forms the earth connection, is screwed directly into the case, A , but the others, B and B^1 , which form the live connections to the working and supplementary batteries respectively, are passed through insulating bushes and terminate inside the case in the two-way contacts, B^2 and B^3 , respectively.

stops, A^2 , and brought into contact with either of the contacts, B^2 or B^3 , against which it is, as before, held in place by the spring, C^3 , and the curved end of the bar, C^4 , acting as a cam against one of the stops, A^2 .

The contacts, B^2 and B^3 , are turned with a coned groove, into which the thin end of the bar, C^1 , is forced, and just as the contact is made, the action of the spring, C^3 , causes the bar, C^1 , to be drawn backwards slightly, and thus to wipe the contact surfaces. In this way the contact surfaces are cleaned both when switching "on" and "off" and a good electrical connection is rendered more certain, at the same time that the necessity for frequent attention is reduced.

CORRESPONDENCE.

. The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

LARGE TYRES.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I have read with great interest Mr. R. E. Gibbons' remarks to the Press on the question of size of tyres; I had no idea that people were so unacquainted with the subject of the size of solid rubber tyres suitable for various weights. For instance, Mr. Gibbons, who otherwise seems to have great experience, tries a 2-in. solid rubber tyre, of some make unknown, on a car weighing 37 cwt. and capable of going 24 miles an hour. The tyres must have been crushed to be absolutely non-resilient, when you take into consideration the fact that a 2-in. tyre is only capable of giving satisfaction on cars weighing not more than 10 cwt. fully loaded. No wonder he gives up the 2-in. section in three months—the wonder is that he kept it on, or rather that it remained on, so long. He then tries a 2½-in. section, which would only be suitable for a car weighing, when fully loaded, not more than 15 cwt.; the wonder is that there was any improvement, considering how overloaded the tyres were under his 37-cwt. car; in fact, there would be almost as little spring in them as in a wooden or iron tyre, which would account for his side-slips and reduced speed.

There is, however, one strange point about his remarks, and that is, with an old 6-h.p. Daimler, he says he can drive a car of 37 cwt. an average of over 19 miles an hour on a run of 115 miles, including

passing through such large towns as Reading, Devizes, Bath, Bristol, and Weston-super-Mare, besides the numerous small towns on the road. This would seem impossible, and as if he had made a mistake to the advantage of his Palmer tyre.

For his information and your information generally, I might mention that in addition to the above stated sizes of Royal Sirdar-Buffer tyres, there are other sizes for heavy weights and high-speed sections; if he had come to the Sirdar Rubber Company for the tyres they would have given him all information with regard to the sizes, and I feel confident he would have taken the size they recommended, and if he had had Royal Sirdars fitted he would not have had trouble and expense with tyres.

For the benefit of your readers I have pleasure in giving you the further following information:—For cars weighing when fully loaded not more than 25 cwt., they recommend the large 3-in. high-speed section Sirdars, and for cars weighing not more than 35 cwt. fully loaded, the 5-in. high-speed section; and his car weighs 2 cwt. more than the latter, so your readers can easily imagine what a serious mistake he made in trying a tyre 2½ times smaller, and more than 2½ times too small.

The public will, I believe, find, at moderate speeds, the anxiety and expense of pneumatics are the only drawbacks to motoring, and reasonable drivers should not travel at more than about 20 miles an hour on account of risks and inconvenience from dust, &c., caused to other lawful users of our British roads, which are unsuitable for high speeds.

I am, Sir, yours truly,

THE SIRDAR RUBBER CO., LTD.,

J. M. MACLULICH, Managing-Director.

RACES, RECORDS, AND TRIALS.



GORDON-BENNETT ELIMINATING TRIALS.—The two first racing cars for this year to arrive in the Isle of Man for the British Eliminating Trials. The cars are two of the Napiers, the drivers at the wheels being, respectively, Mr. Cecil Edge (A1013) and Mr. Arthur Macdonald (A9854).

GORDON-BENNETT CUP.

The British Eliminating Trials.—The weighing and inspection of the cars prior to the race on the 30th instant will be held on the 29th at Mr. J. C. Sharpe's, North Quay, Douglas, at 9 a.m. Arrangements have been made with the Isle of Man Steam Packet Company for a special steamer. Attention is drawn by the Automobile Club to the fact that the Trial on the 30th is not a race but a test of high speed reliability, and includes the following points to enable the judges to select the representatives for Great Britain in the race on the Auvergne Circuit:

- (a) Speed tests against time over 3 miles and $\frac{1}{2}$ a mile in each circuit.
- (b) Speed tests against time in climbing a hill in each circuit.
- (c) Observation of the skill and suitability of the driver.
- (d) Examination of condition of cars at termination of Trial.

The Secretary of the Automobile Club was last week in the Isle of Man making final arrangements for these trials, and it has been decided to adhere to last year's course, and not make the change which was contemplated from St. John's into Peel and thence to Kirk Michael.

The first of the British racers to arrive in the Isle of Man were the two Napiers driven respectively by Mr. Cecil Edge and Mr. Arthur Macdonald. In trying the course, they have reported it as very bumpy and a great many loose stones down, but by the time the race comes off the Isle of Man authorities hope to have the roads in as good a condition as last year, as they are now hard at work getting everything into order.

THE London and North-Western Railway have arranged for a special train to Liverpool on Sunday, May 28th, which will connect with a special steamer for Douglas, leaving Liverpool early in the afternoon of the same day. The train, which will be reserved for members of the Automobile Club and friends, will leave Euston about 9 a.m. Return fares (available for six months), first-class, 58s.; third-class, 33s. Steamer tickets, 10s. in addition. Application for tickets should be made at once to the Secretary, Automobile Club, 119, Piccadilly.

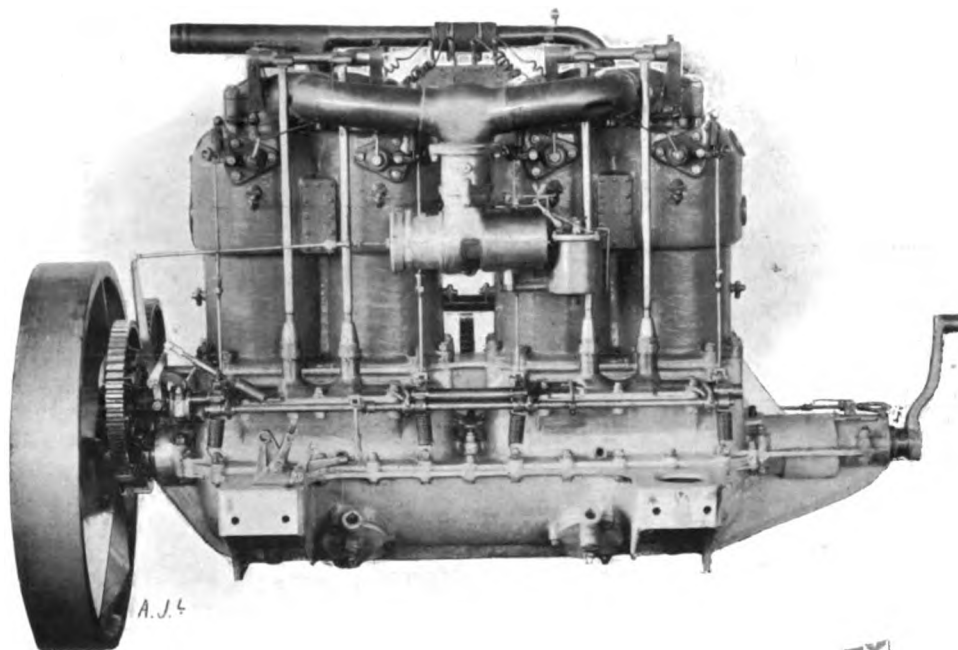
The United Motor Industries (Limited), with their usual foresight, are making arrangements to have a complete stock of accumulators, lubricating oil, sparking plugs, &c., at a special agent at Douglas, viz., Mr. White, of Prospect Hill.

For the French Eliminating Trials the ballot has taken place for the order of starting, the Richard-Brasier firm, the present holders of the cup, being allotted by right the premier position. The same system was followed this year as last in balloting for position, viz., 10 numbers were drawn, and where 3 cars were entered by any one firm the first number determined the position of the other 2 by the addition of 10 in each case, so that the Richard-Brasiers start at 1st, 11th, and 21st; Renaults, 2nd, 12th, 22nd, and so on. In the three cases where only one car has been entered, the corresponding numbers have been omitted altogether, and curiously, therefore, under this arrangement the unlucky number 13 disappears altogether, as C.G.V., which drew No. 3, is the only car of that make entered; the Automoto car draws No. 6, Nos. 16 and 26 being therefore eliminated, and Gobron receives No. 10, Nos. 20 and 30 also disappearing. The full list of cars entered, their drivers, official numbers, and order of starting are as follows:—

- | | |
|--------------------------------------|--------------------------------------|
| 1. Richard-Brasier (Théry). | 15. Hotchkiss II. (Le Blon). |
| 2. Renault (Sizsz). | 17. De Dietrich II. (Rougier). |
| 3. C.G.V. (Girardot). | 18. Darracq II. (Wagner). |
| 4. Bayard-Clement (A. Clément). | 19. Panhard II. (Teste). |
| 5. Hotchkiss (Achille Fournier). | 21. Richard - Brasier III. (Heath). |
| 6. Automoto (Lapertot). | 22. Renault III. (Bernin). |
| 7. De Dietrich (Gabriel). | 24. Bayard-Clement III. (Villemain). |
| 8. Darracq (Hémery). | 25. Hotchkiss III. (Laverne). |
| 9. Panhard (Heath). | 27. De Dietrich III. (Duray). |
| 10. Gobron (Rigolly). | 28. Darracq III. (de la Touloubre). |
| 11. Richard-Brasier II. (Cailliois). | 29. Panhard (H. Farman). |
| 12. Renault II. (Edmond). | |
| 14. Bayard - Clement II. (Hanriot). | |

A very early start is spoken of, viz., 4.30 a.m.

The opinions of various drivers and others continue to be published in regard to the question of neutralisations or otherwise. Alexander Burton, who will represent Austria



THE GORDON-BENNETT RACERS.—View of one of the 1905 Mercedes Engines, from the right side, showing the push-rods that operate the inlet-valves above the cylinder heads, the low-tension igniters with their operating and "timing" gear, and the carburettor.

in the race, has been round the circuit forty-five times. He states that, although there are at least 40 kiloms. in which it will be very difficult to pass, he nevertheless is strongly opposed to any neutralisation, and he thinks that the wilful holding back of any car should be easily dealt with by the A.C. de France. In regard to pneumatic tyres, he thinks that it would be hardly possible for any tyres to stand four runs at high speed round the entire circuit, and that he thinks competitors will be wise if they arrange beforehand a fixed point during the race where they will change their tyres.

Baron de Caters is equally strong against any neutralisation, and Mons. A. Darracq also agrees upon the same point.

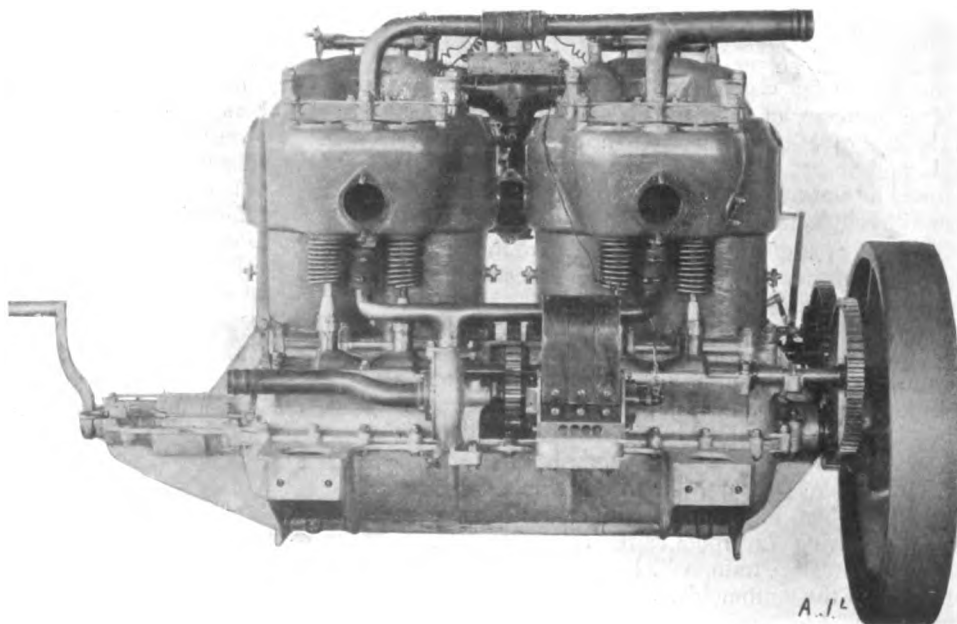
In spite, however, of the opinions of the majority of the competitors being in favour of no neutralisations, the authorities appear to be taking a very different view. In fact, the Minister of the Interior has plainly intimated that neutralisations will be necessary, the points indicated being at Rochefort, Laqueville and Pontgibaud. In addition, it is intimated that intervals of four minutes between each car must be enforced at Vierge, at Lastic and at

Cratere. This new feature is now being carefully considered by the A.C. de France officials, as there is no doubt the Government will require something in the shape of a "halt" at certain points.

Chevalier Renè de Knyff, the President of the Sporting Commission of the A.C. de France, was last week the victim of a very severe accident due to coming in contact, when traversing the course, with an erratic cow. We are glad to learn that beyond two broken ribs M. de Knyff is progressing favourably.

The Renault cars this year are sure to be watched with no small interest by everyone to whom unusual design

in high speed cars appeals. Although not an entire novelty, yet it is a remarkable departure for one of the larger French makers to place the main-frame beneath, instead of above, the two axles. Such, however, is done on these vehicles, the frame being of pressed steel with tapering side-members that curve downwards at both ends. The semi-elliptic springs, which are very flat, are also fixed to the underside of the axle, and the centre of gravity has been kept so low that there is a minimum clearance of only 11 cm. (about $4\frac{5}{16}$ in.) above the ground.



THE GORDON-BENNETT RACERS.—View, from the left, of one of the Mercedes engines, showing the arrangement of the exhaust-valves, and the positions of the gear-driven magneto and pump. These engines have a slightly larger bore than those of last year, they run at a somewhat higher normal speed, and develop about 120-h.p.

The other distinctive characteristic of the 1905 design is more in accordance with the previous practice of the firm, consisting as it does of a horseshoe-shaped radiator that practically forms the dashboard, and encircles the fan fly-wheel. The radiator is built up of finned tubes, and a pump is used for circulating the water. The following are the other main features of the car. The 4-cylinder engine has all its valves in line, on the left side, and each of the two cylinder castings is provided with a copper water-jacket, that is held in place by screws. The engine develops about 90-h.p. at 1,300 revs. per min., and it has a centrifugal governor, and a high-tension magneto ignition system. For facilitating starting, a half-compression device is available, and arrangements are made for using accumulators with the ignition apparatus at such times. The "live" rear axle is placed in line with the axis of the crank-shaft, so that the universally-jointed propeller-shaft usually affords a perfectly straight drive. The clutch is of somewhat special construction in order to ensure "soft" action, and is in the main of the well-known leather-faced cone variety. Three forward speeds and a "reverse" are available, and there are two brake-pedals in addition to the side lever. One of these pedals applies a brake fitted immediately behind the gear-box, and the other actuates a pair on the hubs of the road wheels.

Another of the new French Gordon-Bennett models which differ considerably in design from previous practice, is that of the C. G. V. Co. The pressed steel frame has unusually deep side members, which are perforated with large holes in order to reduce the weight. The suspension in front is usual, for there are a couple of semi-elliptic springs above the front axle, but, at the back, the "live" axle is carried in curved horn-plates, and is connected with the frame by long leaf springs that project rearward from the side members. The two horn-plate guides are stayed together by tubes, both above and beneath the axle, and the entire build of the machine is so low that the fly-wheel comes within 18 c.m. (less than 7½ in.) of the ground. The wheel-base is 2 m. 50 (a little over 8 feet), and the tyres are 820 and 880 mm., by 120 mm., in front and behind, respectively. The 4-cylinder engine, which is capable of giving about 130-h.p. at 1,200 revs. per min., is fixed to the frame with a three-point suspension, and it is provided with two independent high-tension ignition systems, the one having a magneto and the other an accumulator. The cylinders have a bore and a stroke of 160 mm. Four forward speeds are rendered available by the change-speed gear, which is of the Mercedes type, and the entire transmission mechanism is so arranged that the propeller-shaft has practically no angularity, and lies almost exactly horizontal. In addition to the usual foot-brake, acting on the gear shaft, a second brake-pedal is connected up with the same hub brakes that are applied by the side lever.

Tourist Trophy.—One more entry in this race has brought the competitors up to 53, the latest of these being Mr. W. M. Jenkins with a Royal Enfield car.

Recently we announced for this race the offer of a 10-guinea cup by the Continental Tyre Company for the car fitted with Continental tyres which accomplished the fastest circuit. The Company now advise us that they are offering another cup of the value of 100 guineas for the winner of the Trophy, provided his car is fitted with Continentals.

Fuel Consumption Trial.—The Fuel Consumption competition arranged by the Midland A.C. took place last Saturday, starting from Wishaw Hall Farm. We last week gave particulars, and a map of the route which the cars were to follow, and also published the formula under which the three medals offered were to be awarded. The event was very successfully carried out in exceptionally good weather, and in the result the three medals were awarded as follows:—Gold Medal: Mr. C. W. Dixon, 12-h.p. Lanchester; Silver Medal: Mr. R. R. Brown, 10-h.p. Wolseley; and Bronze Medal: Mr. Cecil Edge, 15-h. Napier. The arrangements were very excellent, and special provision was made to ensure that the speed-limit was properly respected. In fact, telephonic communications were established at various points from Wishaw Hall Farm, whereby the passing of the cars was regularly checked, and throughout the trial it was found that in no cases had the competitors departed from the regulations laid down. Mr. T. H. Ryland acted as hon. secretary and general organiser. The full results, with the fuel consumed, &c., are as follows:—

	Driver and Car.	Weight		Petrol	Points
		cwt. lb.	gals.		
1	C. W. Dixon (12-h.p. Lanchester) ...	28 7	2'50	7'85	
2	R. R. Brown (10-h.p. Wolseley) ...	25 63	2'61	6'84	
3	C. Edge (15-h.p. Napier) ...	29 7	3'04	6'69	
4	A. E. Crowdy (12-h.p. Wolseley) ...	28 35	3'27	6'06	
5	G. H. Lanchester (12-h.p. Lanchester) ...	31 49	3'87	5'68	
6	C. V. Pugh (12-h.p. Lanchester) ...	29 92	3'75	5'55	
7	A. Luff-Smith (14-h.p. Wolseley) ...	26 70	3'64	5'11	
8	A. A. Remington (6-h.p. Wolseley) ...	14 5	2 14	4'87	
9	W. Stokes (16-20 h.p. Clement-Talbot) ...	25 84	4'10	4'39	
10	G. B. Willis (10-h.p. Wolseley) ...	25 7	4'29	4'08	
11	G. F. Heath (15-h.p. Darracq) ...	28 101	5'04	4'00	
12	E. W. Lewis (8-h.p. Rover) ...	14 35	2'57	3'90	
13	W. B. Davis (12-h.p. Traffic) ...	21 14	4'05	3'65	
14	A. J. W. Millership (6-h.p. Wolseley) ...	17 6	3'86	3'09	
15	A. W. Keep (6-h.p. De Dion) ...	12 49	2'96	2'94	
16	W. Walford (4½-h.p. Tricar), retired ...	6 84	—	—	



The 10-Guinea Cup presented by the Continental Tyre Company in connection with the Tourist Trophy Race.

Irish Hill Climb.—The members of the Irish Automobile Club met on Saturday last at Glendha, County Dublin, to decide the annual hill climb, which, for the third year in succession, was held over the same venue. The course measures seven-eighths of a mile, the average gradient being 1 in 11. Saturday's contest was divided into four classes, arranged as to cost of car. Six competitors came forward in Classes A and B, including two lady drivers, Mrs. R. J. McCreedy and Miss Dacres Thomas. The former was second in Class A, an event which that lady had won for the past two years, but Miss Thomas was unsuccessful in Class B. The weather was all that could be desired, and the arrangements were of a satisfactory nature. The times were taken by Messrs. T. W. Murphy and Colman O'Connell. The following are the returns :—

CLASS A.—Cars costing £200 or under.

		ma.	s.	
Dr. Colohan ...	6-h.p. Wolseley ...	3	17	1
Mrs. McCreedy ...	8-h.p. Rover ...	3	31	2
A. J. Hardy ...	7-h.p. Star ...	3	46	3
Dr. Colohan ...	6-h.p. Wolseley ...	4	20	4
Major Thornhill ...	6-h.p. Wolseley ...	4	55½	5
H. B. Hill ...	6-h.p. De Dion ...	5	46½	6

CLASS B.—Cars costing £400 or under, to carry one adult passenger or chauffeur.

J. O'Connor ...	12-h.p. Darracq ...	3	8½	1
G. P. A. Colley ...	12-h.p. Argyle ...	3	52	2
L. J. O. Higgins ...	10-h.p. Gladiator ...	3	2	3
Major Thornhill ...	6-h.p. Wolseley ...	4	11½	4
Miss Dacres Thomas ...	9-h.p. Talbot ...	4	30	5
F. C. Hayes ...	10-h.p. Wolseley ...	5	9½	6

CLASS C.—Cars costing £600, to carry one adult passenger or chauffeur.

J. M. Davies ...	16-h.p. Georges-Richard	Did not finish.
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CLASS D.—Unlimited as to price, to carry one adult passenger or chauffeur.

T. Henshaw ...	28-30-h.p. Daimler ...	2	11	1
W. G. D. Goff ...	20-h.p. Clément ...	2	37½	2

Gatacre Hill-Climbing Competition.—This takes place on Saturday next, May 27th, under the auspices of the Wolverhampton A. C. At the luncheon, which takes place at the Falcon Hotel, Bridgnorth, prior to the event, the Mayor and Town Clerk of Bridgnorth, the Mayor and Chief Constable of Wolverhampton, the Chief of the Police, and the Surveyor for the County of Salop, the Superintendent of Police, and Surveyor of Bridgnorth and others, are expected to be present.

Filey Speed Trials.—The programme of events down for Whit Monday (June 12th) has now been issued by the Yorkshire A.C. under whose auspices this meeting has been arranged. The races will commence about 3.30 p.m., and there will be eight events, viz., six club events open to members of the Club and those affiliated to the Y.A.C., and two open events. The course will be over 1½ miles. The Club items are :—

Class A, for the Whiteman Cup, single cylinder touring cars up to 6-h.p. carrying two passengers, and above 6-h.p., 4 passengers.

Class B, 2, 3, or 4-cylinder cars up to 12-h.p. carrying 4 passengers.

Class C, 2, 3, or 4-cylinder touring cars up to 16-h.p., 4 passengers.

Class D, for the *Sheffield Telegraph* Trophy, touring cars up to 24-h.p. carrying 4 passengers, divided into two classes, up to 12-h.p. and up to 24-h.p., the winner of each class to meet in final on handicap terms.

Class E, for the H.R. Kirk Trophy, touring cars over 20-h.p., and up to 30-h.p. carrying 4 passengers.

Class F, cars of any h.p. carrying 2 passengers.

In addition to the cups and trophies for the above events, in each class first and second prizes will be given consisting of 2 medals in each case. In the open events, for which suitable prizes will be offered :—

Class G is for touring cars up to 24-h.p. carrying 4 passengers.

Class H, racing cars of any h.p. not exceeding in weight 1,000 kilograms.

The object of this race is to establish a "Yorkshire record."

On June 10th a banquet is to be held at the Royal Crescent Hotel, Filey, in connection with the races, and members returning on the Tuesday morning are invited to visit Thorpe Hall, Bridlington, the residence of Mr. J. W. M. Bosville, J.P., who will welcome his guests at luncheon.

THE Commercial Van Trials this year of the A.C.G.B.I. have now been definitely fixed to take place, extending over 30 days, from September 20th to October 24th next.

THE annual hill climb of the Cambridge University Automobile Club will be held on June 4th at Offley Hill, Hitchin, starting at 11 a.m. Mr. Lionel de Rothschild's Challenge Cup for cars and the Garnett-Botfield Challenge Cup for motor cycles will be the special prizes for competition.

HEAVY Vehicle Trials in all probability will be held by the A.C.G.B.I. next spring.

Springfield Hill Climb (U.S.A.).—On Pecowsic Hill, Forest Park, Springfield, Mass., on April 26th, the annual hill climb of the Springfield Club took place. Altogether sixty-five entries were received, and the timing was by electric apparatus. The length of the hill is four-tenths of a mile, with gradients up to over 6½ per cent. The best time was made by a 50-h.p. Grout steam racer, viz., 34s., the best time for petrol cars being made by a 60-h.p. Napier, 35½s. The best times in each of the classes were :—

CLASS A.—Steam machines, 50-h.p. Grout, 34s.

CLASS B.—Price under £200. (1) 10-h.p. Ford, 47½s.; (2) 10-h.p. Autocar, 64½s.; (3) 9-h.p. Cadillac, 72½s.

CLASS C.—Price £200 to £300. (1) Reo, 54½s.; (2) 10-h.p. Rambler, 65s.; (3) 16-h.p. Rambler, 70½s.

CLASS D.—Price £320 to £500. (1) 20-h.p. Stevens Duryea, 47½s.; (2) 24-h.p. Winton, 51½s.; (3) 24-h.p. National, 52½s.

CLASS E.—Price over £600. (1) 35-h.p. Columbia, 41½s.; (2) 40-h.p. Thomas, 44½s.; (3) 40-h.p. De Dietrich, 50½s.

CLASS F.—Open. (1) 60-h.p. Napier, 35½s.; (2) 20-h.p. Stevens-Duryea, 37½s.; (3) 50-h.p. Grout (steam), 37½s.

CLASS G.—4-passenger cars. (1) 35-h.p. Columbia, 43½s.; (2) 40-h.p. Thomas, 44½s.; (3) 40-h.p. Stearns, 47½s.

CLASS H.—Motor cycles. (1), (2), and (3), Indians, respectively, 36½s., 37s., 42s.

Silencer Competition.—The awards in the Silencer Competition recently concluded, under the auspices of the A. C. de France, are now announced as follows :— Ordinary silencers : Silver-gilt medal, Soc. Anon. Clair (Conti patent); Silver medal, M.M. Ossant Frères, E. D. Retz, and Aussud; Bronze, M. Carteret;

Hon. mention, M. Cochaux. Water jacketed silencers: Silver medal, Messrs. Ossant Frères, Lefebvre (St. Denis patent).

Vanderbilt Cup.—Eighteen cars have now entered on behalf of France for the Eliminating Trials for this race. The complete list to date is 3 Panhards, 1 C.G.V., 3 Renaults, 3 De Dietrich, 2 Darracqs, 3 Clement Bayards, 3 Richard-Brasiers.

For America 11 entries have been made, comprising 2 Pope Toledos, 2 Mathesons, 1 Franklin, 1 Premier, 1 Haynes, 1 Thomas, 1 Royal, 1 Locomobile, and 1 Christie.

Coupe de Loiret.—On Sunday last, the 14th instant, the first stage for this Cup was commenced. We have already given full particulars of the competition, which is a French endurance test for tourist cars over 2,000 kiloms., spread over eight stages, starting from and returning each day to Orleans. Motor cycles are also admitted under somewhat different conditions. On the first day twelve cars and four motor cycles started. The competition concludes on Monday next.

IN connection with the Mont Cenis Hill Climb, the Countess Cacherano de Bricherasio has offered a challenge cup reserved for competition for light speed-cars.



MOTOR BOATING.

THE ALGIERS-TOULON MOTOR BOAT RACE.

It is impossible to say that the second stage of this competition deserved the name of a race at all, for none of the boats that started from Port Mahon arrived at their destination—with one exception, and that by a sort of poetic justice was the winner of the first stage from Algiers to Port Mahon. We refer to Fiat X., which finished the race on the deck of a destroyer, which, to prevent the total loss of the motor boat, had fortunately taken it on board in time. All the other competing craft are at the bottom of the Mediterranean. Never has a boat race of any kind provided such a pertinacious catalogue of catastrophes. The original intention had been that the motor boats, after their arrival at Port Mahon, should start the second half of the race on Tuesday evening, but stress of weather prevented this project being carried out, and it was not until 4 o'clock on the morning of the following Saturday that the weather permitted of a start being made, and Fiat X, Camille, Quand-Même, Mercedes-Mercedes, Héraclys, Malgré-Tout, and Mercedes C.P. got under way successfully. At the commencement the sea was calm, and the Camille, navigated by Madame Du Gast, surpassing her excellent performance on the stage to Port Mahon, in which she was only second to the Fiat X, eclipsed that boat on the present occasion, and was leading the race, when at about 100 kiloms. out from Port Mahon the barometer began to behave in an exceedingly suspicious manner, and the Mistral came up and struck the little fleet of competitors, cruisers, and convoying destroyers with more than Mediterranean suddenness. In a short time everything was practically over. The Fiat was fortunately lifted on board her convoying destroyer, and the crews of all the others, excepting the Quand-Même, were taken off by the destroyers that accompanied them. Attempts, lasting for a certain length of time, were made to tow Mercedes C.P. and Malgré-Tout, which, however, broke their hawsers and ultimately sunk, probably owing to the sinking action of the heavy steel hawsers attached to them. For some time the fate of the Quand-Même with the Duc Decazes on board was uncertain, but ultimately it proved that that crew had also been rescued, though the boat was abandoned to its fate, doubtless going to the bottom like all the others.

The experiences of the Camille and Madame Du Gast are perhaps the most exciting of any that were gone through by the unfortunate craft. As already stated,

when struck by the storm, the Camille was leading, but almost at once her machinery went wrong and she became unmanageable. The cruiser Kléber lowered a boat and stood by, endeavouring to shelter both the motor boat and the cruiser's whale boat from the gale, but the storm was too much for the whale boat, and it was beaten back. Then the commander of the Kléber executed a daring and splendid piece of seamanship. He hove off a little, and making a sweep bore right down on the disabled Camille, so accurately judging his distance that the bows of the cruiser and little cockleshell motor boat actually scraped together. Ropes were then thrown, and sailors from the Kléber endeavoured to transfer the crew, commencing with Madame Du Gast, to the cruiser's deck. The first attempt was a failure, and Madame Du Gast fell headlong into the sea. Three men-of-war's men promptly sprang after her, and ultimately she and all the rest of the crew of the Camille were got safely on board. The incident is a testimonial to the fine qualities of the French navy.

To Madame Du Gast, however, perhaps the palm for real heroic courage (particularly considering her sex) should be awarded. When the rope was thrown from the cruiser, she insisted on her men being rescued first, and it was only when Lieut. Menier threatened to sheer off if he was not obeyed, that she consented to be saved first. That is the sort of thing of which the French may well be proud.

The cost of the convoys provided by the French Government, and which prevented the fiasco becoming a tragedy, amounted, it is said, to £8,000.

Boulogne-Folkestone-Boulogne.—The A.C. de France have decided that the cross-Channel motor boat race on July 15th shall be in one journey to Folkestone and back, starting from Boulogne at 8 a.m., a total distance of 94.45 kiloms. There will be four classes for racers according to length, and one for fishing boats. Entrance fees to June 24th, 100 francs for 8-metre boats, 200 francs for boats above 8 metres. Double fees up to July 8th. Competing boats must be at Boulogne July 12th, and there will be an exhibition of the craft in the Basin on July 14th.

Southampton Motor Boat Trials.—The last day for entry for these trials has been extended until June 24th instead of May 27th.



A picturesque example of the Old World and the New. In Soldiers' Home Park, Washington. A party of Sioux Indian braves in a "devil carriage."

CLUB AND ASSOCIATION DOINGS.

Motor Union Inter-Club Meet, May 20.—The Duke of Portland will personally receive members of the Motor Union, who are going to Welbeck on Saturday, and will himself conduct the party, after showing them round Welbeck Park, to Edwinstowe, where afternoon tea will be served. On Saturday morning the Mayor of Nottingham will give a civic reception to the members of the general committee of the Motor Union.

Marine Motor Club of Great Britain and Ireland.—The recommendation of the Marine Motor Committee of the Automobile Club for the formation of the Marine Motor Club has met with universal approval. A set of rules have been drawn up, and were submitted to a meeting called on Monday last, when the formal founding of the club was arranged under the title of the Marine Motor Club of Great Britain and Ireland. This club has been formed mainly for the development of the sport and industry of motor boating. Hitherto the Marine Motor Association, formed in 1902, has directed its attention chiefly to legislative matters, and has not in any way attempted to organise race meetings or regattas. The new club will in future be responsible for the organisation of all trials, &c., and will conduct this year the Reliability Trials in Southampton Water and organise and control the British International Cup Race. The Automobile Club, by way of helping the new club, has undertaken to provide a sum of £600 for the first year, and £300 for the next two years, towards the establishment of a club house at Southampton or other suitable place, and towards the other expenses of the club. The subscription will be three guineas per annum to members other than members of the Automobile Club, who will pay two guineas per annum. The first 250 members will be founder members, and will pay no entrance fee. Amongst the advantages which are offered to members of the new club are a club house on the waterside and an office in London, reduced entrance fees for races and trials held by the club, Customs facilities for introducing boats on the Continent, special club railway tickets, &c. At the club house near Southampton, sleeping, dressing, and locker accommodation are to be provided, and meals will be obtainable. Arrangements for the storage and sale of petrol

and for executing repairs will be undertaken, and already, in addition to the Reliability Trials and the International Cup, arrangements are in progress for organising other races and cruises during the season.

Dr. Boverton Redwood presided at the meeting on Monday, which included a large number of prominent men, well known in connection with motor boating, including Lieut. Mansfield Cumming, Mr. Linton Hope, Mr. S. F. Edge, Mr. H. L. Clark, Mr. W. Cross, Capt. Dixon, Major Lindsay Lloyd, Mr. J. M. Gorham, Mr. A. F. Armstrong, Mr. Bernard Redwood, and Mr. Basil Joy. The meeting was unanimous in its approval of the scheme, and in a few minutes about fifty of those present sent up their names as joining members, whilst a large number who were prevented from being present had signified their desire to join the new club, including Earl Russell, Mr. Lionel de Rothschild, &c. Dr. Boverton Redwood was unanimously elected as vice-commodore, the position of commodore being left open, as it was explained by Dr. Redwood that it was hoped to obtain the acceptance of that position by some august personage. Lieut. Mansfield Cumming was elected as rear commodore, and ten of the full committee of twenty were by ballot elected as follows:—Mr. J. M. Gorham, Major F. Lindsay Lloyd, R.E., Capt. R. T. Dixon, R.E., Mr. G. F. Sharp, Mr. H. G. A. Rouse, Mr. Linton Hope, Mr. Bernard Redwood, Mr. F. R. S. Bircham, Mr. H. C. Tower, Mr. H. L. Clark, and Mr. Lionel de Rothschild. It was suggested by Mr. S. F. Edge that no members of the trade should be appointed to the committee, but the meeting were not in favour of this step for the present. He also advocated an arrangement being come to with the British Motor Boat Club, as he thought that there was not room for two clubs, and he felt sure that many of the members of the British Club would be willing to transfer their support to the Marine Motor Club. Mr. Basil Joy was elected secretary and hon. treasurer pro tem. The meeting was adjourned until June 19th, when the remainder of the committee will be elected. In the meantime, we understand, applications for membership are coming in freely, so that those desirous of being numbered amongst the 250 founders must get in their names without delay.

Motor Cycling Club.—By the election of 14 new members at the last committee meeting, the club now have brought their membership up to 200.



THE automobile has now succeeded in penetrating even to the very centre of Darkest Africa, the British Central African Protectorate having a number of motor traction engines now at work, while the Commissioner himself travels about on a motor cycle. Doubtless the dusky aborigines attribute supernatural properties to this machine, and we should not be surprised to learn that, as in the case of a certain "Yunkum sahib," the conveyance has been designated "a devil carriage."

WE are glad to learn that the Surrey County Council has decided to carry out experiments for the diminution of dust on the public highways, and to devote £2,000 to the purpose. Of course the usual *advocatus diaboli* has appeared insisting that the ratepayers ought not to bear the expense of these experiments, as motorists only constitute one-fifth of the ratepayers in the county (we are glad to hear they are so numerous), and that it is unfair that the other four-fifths should be compelled to pay for damage they do not cause. It is a little ridiculous to suggest that heavy brewers' vans, traction engines, and farm carts do not assist in producing dust on roads. In fact, it is vehicles of this type that produce nearly the whole of it, it being universally admitted that the worst that automobiles do is to distribute it. As it was admitted that along the Ripley Road and other similar places rents have gone down owing to the dust nuisance, it is obvious that the removal of that trouble will ultimately have the effect of raising the general rateable value. Why motorists only should be called upon to pay for this, is a mystery it is not easy to explain.

MOTOR CYCLING.

International Cup.—The Moto Club of France have rescinded their resolution for this year's eliminating trials whereby only Frenchmen, or drivers who have resided in France at least one year, can take part on behalf of France in the race. It has been pointed out that sufficient notice was not given. Hence the change. For 1906 this regulation, however, will be enforced. For the French trials there are now 16 entries, viz., 3 Alcyons, 2 Gillets, 3 Peugeots, 3 Griffons, 1 Stimula, 1 Fleury, and 3 Magali. For the Austrian team 8 entries have been received.

Motor Cycle Endurance Run.—The big Tour de France organised by the Auto-Cycle Club of France started on Saturday, May 6th, when 29 riders left Paris, of whom 26 arrived within the prescribed time at Dijon for the first stage, a distance of 320 kilometres. The contest was not to be concluded until the 14th inst., during which time the main points visited by the competitors, starting from Paris, were: Dijon, Lyons, St. Etienne, Avignon, Marseilles, Nîmes, Toulouse, Limoges, Orleans, back to Paris, a total of 2,041 kilometres. The machines were divided into three categories, viz.:—Category 1, maximum cylinder capacity $\frac{1}{2}$ litre; Category 2, 225 cm. cube; Category 3, motor cycles with fore-car or trailer, max. cyl. 500 cm. c. In the 1st Category there were 23 starters; in the 2nd, four; and in the 3rd, two.

At the finish on Sunday last, the competitors were reduced to 16, the rest for various reasons having fallen by the way. The only competitor left in the 3rd Category for motor cycles with fore-car or trailer, was Hooydonk with his Phoenix trimo. On the last day the machines were timed on the Dourdan Hill. The best time was made by Thomas on a Magali machine of 1m. 31 $\frac{1}{2}$ s., the length of the hill being 1'35 kilometres. The results by points published for each class are given below, together with the times recorded on the Dourdan Hill, which are subject, however, to official revision:—

Place.	Machine and Driver.	Points.	Hill Time.
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CAT. I.— $\frac{1}{2}$ rd litre.

			m.	s.
1	Peugeot (Cissac) ...	1,212	1	45 $\frac{1}{2}$
2	Peugeot (Giuppone) ...	1,200	1	32 $\frac{1}{2}$
3	Griffon (Bucquet) ...	1,192	2	9 $\frac{1}{2}$
4	Minerva (Blatgé) ...	1,183	2	25 $\frac{1}{2}$
5	Peugeot (Champoiseau) ...	1,168	2	10 $\frac{1}{2}$
6	Werner (Bonnard) ...	1,151	2	9 $\frac{1}{2}$
7	Minerva (Schweitzer) ...	1,146	2	7 $\frac{1}{2}$
8	Magali (Thomas) ...	1,129	1	31 $\frac{1}{2}$
9	Bruneau (Foulon) ...	1,107	2	19 $\frac{1}{2}$
10	Stimula (Lepetit) ...	1,098	2	30 $\frac{1}{2}$
11	Lamandière (Canesse) ...	973	2	7 $\frac{1}{2}$
12	Werner (Coutant) ...	953	2	51 $\frac{1}{2}$
13	Peugeot (Yourassoff) ...	883	2	28 $\frac{1}{2}$

CAT. II.—225 cm. c.

1	Clément (Dacier) ...	803	3	17
2	Terrot (Faivre) ...	832	3	21 $\frac{1}{2}$

CAT. III.—Motor cycles with forecar or trailer, 500 cm.

1	Phoenix Trimo (Hooydonk) ...	783	3	21
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Auto-Cycle Club.—Members' Penalty Run.

The Auto-Cycle Club were again favoured with delightful weather on Saturday last, when they carried out their first Members' Penalty Run of the season under most satisfactory conditions. The starting point for the run was the "Angel," Thames Ditton, and the route was *via* Guildford, Godalming, and Petersfield, to the 64th milestone on the Portsmouth Road (between Horndean and Waterloo), and back again to Ditton. An entry of 20 members had been received for the event, 19 riders actually starting, the other entrant being unable to start owing to tyre troubles. Soon after 2 o'clock, Mr. G. F. Sharp, who was acting as judge, explained to them the conditions of the run, which were as follows:—

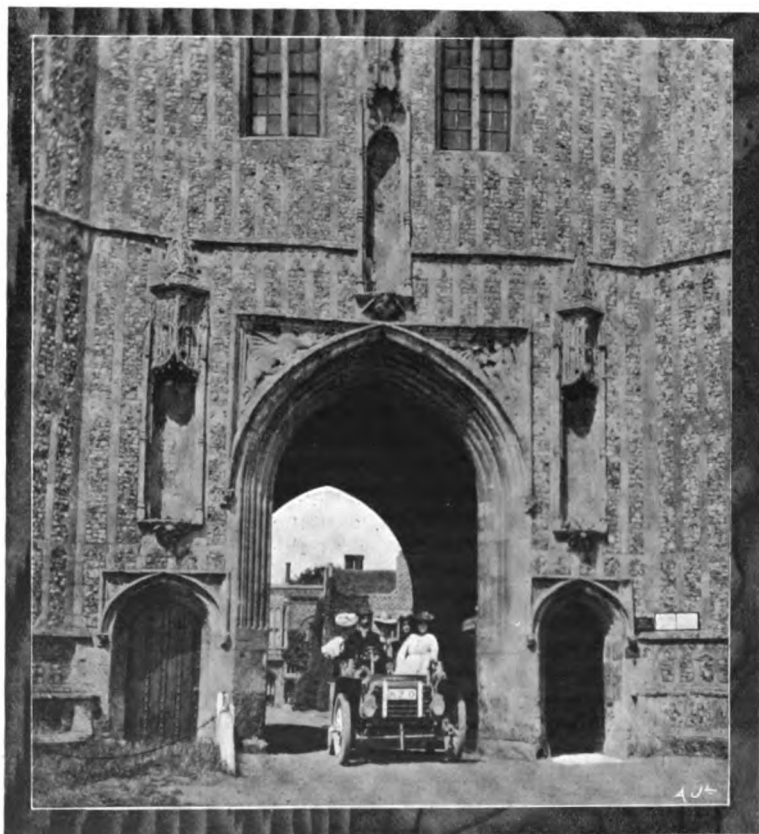
Any competitor making a stop would be fined 6d. for each stop, and in the event of a competitor not completing the journey within 6 hours, he would

be fined 2s. 6d. After warning the men against exceeding the limit of 20 miles per hour, and pointing out that any rider arriving at the turning point within 2 $\frac{1}{2}$ hours from the start or arriving back within 5 hours, would be disqualified, the following riders were despatched on their journey:—

R. W. Ayton, 3-h.p. Triumph; F. Hulbert, 2 $\frac{3}{4}$ -h.p. Triumph; E. M. Jones, 4 $\frac{1}{2}$ -h.p. Lagonda; H. P. Rose, 3-h.p. Roc; H. R. Dougal, 3-h.p. Fafnir; J. J. Leonard, 2 $\frac{3}{4}$ -h.p. Lurquin Condert; T. Sopwith, 2 $\frac{3}{4}$ -h.p. Bat; H. E. Lowe, 3-h.p. J.A.P.; W. E. Blackwood, 3-h.p. Fafnir; A. Simmonds, 3 $\frac{1}{2}$ -h.p. Rex; R. M. Brice, 3 $\frac{1}{2}$ -h.p. Brown; A. B. White, 3 $\frac{1}{2}$ -h.p. Roc; H. Alldridge, 3-h.p. Fafnir; S. E. Pemberton, 3-h.p. Singer; A. G. Reynolds, 2 $\frac{3}{4}$ -h.p. Bat; R. A. Smith, 3 $\frac{1}{2}$ -h.p. Ormonde; H. G. Cove, 4 $\frac{1}{2}$ -h.p. Humber Olympia; Wilbur Gunn, 10-h.p. Lagonda tricar; J. F. Crundall, 4 $\frac{1}{2}$ -h.p. Humber Olympia.

The first rider to incur a penalty was S. E. Pemberton, who had to pay 6d. for a choked feed pipe; on Hindhead the Olympia, driven by H. G. Cove, was put out of the competition by broken balls in the wheel bearings, which cost him 2s. 6d. Messrs. Reynolds, Leonard, Smith, Ayton and Dougal incurred sixpenny fines through being obliged to take in petrol, Dougal also having to pay 6d. for recovering his cap which he dropped. H. P. Rose had a puncture on the outward journey, which cost him sixpence; J. F. Crundall also having to pay the same amount for his trembler blade sticking soon after turning. A. Simmonds incurred a sixpenny fine through having to dismount owing to his belt slipping in Guildford on the return journey, and W. E. Blackwood had to stop to adjust a broken high-tension wire, which cost him 6d. A. B. White failed to finish, thereby incurring a half-crown fine.

Mr. J. D. Siddeley kindly placed one of his cars at the disposal of the club for the use of the officials, and Mr. E. Hunt, of Fareham, was good enough to arrange for the checking and turning of the competitors at the 64th milestone.



The entrance to St. Osyth Priory, one of the historical Essex mansions which many visitors will be able to visit by means of one of the motor car services which the Great Eastern Railway are this season inaugurating.



ENCIRCLING THE WORLD WEEK BY WEEK.—During his tour round the globe, Mr. C. J. Glidden must be gathering together an invaluable album of celebrities. From time to time we have published extremely interesting photographs sent by Mr. Glidden showing various prominent people of world-wide reputation who have accepted seats on Mr. Glidden's Napier car, and who have no doubt at the same time had a pleasant experience of automobilism. In the above we give the latest photograph received. This was taken outside the residence of the Right Hon. G. H. Reid, Prime Minister of Australia. Mrs. Reid, the wife of the Prime Minister, and her two sons, Masters Douglas and Clay Reid, are in the car, Mrs. Glidden being the other occupant.

MR. E. A. GREATHED has been appointed assistant secretary to the A.C.G.B.I. by the club committee.

MR. E. A. ROSENHEIM, B.Sc., read a Paper on "Motor Vehicles for Goods and Passenger Service" on Tuesday last at the University of Liverpool Motor Club.

THERE have been a large number of outcries as to the alleged extent to which automobile traffic injures the high roads, but that much serious injury has been inflicted by rubber tyres is an opinion which the unprejudiced mind finds it somewhat difficult to accept. Nevertheless, statements to that effect are in circulation, and the *Municipal Journal*, anxious to get to the bottom of the matter, has been taking a canvass of the views of a number of county surveyors on the subject. The majority of these authorities are of opinion that the tyres of ordinary motor vehicles do practically no harm (though some of them express a different view), and are inclined to the opinion that heavy road transport is detrimental, though they differ as to the extent of the injury which it causes, while at least one of the surveyors is of opinion that self-propelled heavy traffic is no worse than similar traffic in horse-drawn vehicles. The result of the canvass thus appears to be a practical consensus of authorities on the

subject that ordinary tourist car traffic at reasonable speeds does practically no harm whatever.

EXPERIMENTS for dealing with the dust on public highways are to be carried out by the Surrey County Council, and £2,000 has been voted for this purpose.

THE Battersea Polytechnic has been accorded the privilege of instructing about fifty drivers of the horse-drawn omnibuses of the London General Omnibus Company for taking charge of the new motor omnibuses of the Company.

OVER 1,000 danger signals and sign-posts in the various districts under the control of the East Sussex County Council are to be erected by the Council for the benefit of automobilists. These signals are to be placed at cross-roads, dangerous corners, and precipitous descents, and will cost £900.

AMONG the amusing suggestions put forward in the ridiculous discussion in the House of Commons on the motor car question, one of our legislators calmly proposed that the numbers which cars are compelled to carry should be increased to the size of those with which ordinary fishing smacks are adorned!

MR. WASON has not been content with his utterances on the motor car question in Parliament, though these, as we point out elsewhere, are sufficiently entertaining to prevent his being forgotten for a considerable length of time. He has carried his anti-automobilist fanaticism even further, and has written to the Lord Mayor of London and the Chairman of the County Council complaining that the rate at which motors travel through the Metropolis is "intolerable." Doubtless the Lord Mayor and the Chairman of the County Council are, in consequence, audibly shaking in their shoes.



A TYPICAL ROAD IN FLORIDA.—The occupants of the Panhard car in our photograph are A. Masseneat and "Pal," the artist, who was responsible for the decorations of the Automobile Salon in New York.

PUBLICATIONS RECEIVED.

Bournemouth. The Official Publication of the Corporation. Edited by Geo. W. May. London: The Health Resorts Association, 2, Gray's Inn Road, W.C.

Broadstairs. The Official Publication of the District Council. Edited by Geo. W. May. London: The Health Resorts Association, 2, Gray's Inn Road, W.C.

Southport. The Official Publication of the Corporation. Edited by Geo. W. May. London: The Health Resorts Association, 2, Gray's Inn Road, W.C.

Aberystwyth. The Official Publication of the Corporation. Edited by Geo. W. May. London: The Health Resorts Association, 2, Gray's Inn Road, W.C.

Catalogues.

"Brown Cars." Brown Brothers (Limited), Great Eastern Street, E.C.

No. 44. Motor Car Accessories and Clothing. J. D. Lyell and Co. (Limited), 55, Victoria Street, S.W.



THE extreme danger of drivers attempting to navigate motor cars through the streets or on the high road when in a condition of inebriation, are so serious that everyone must applaud the recent decision of a London magistrate to send a motor driver who was convicted of this offence to prison for one month without the option of a fine. This is as it should be. At the same time we would warn all concerned that the charge of drunkenness is one which the police bring with most improper readiness, and that the appeal by the person accused to the divisional doctor appointed by the police is usually of little use, as his appointment is rarely renewed should he maintain in one or two cases that the persons the police charge with drunkenness are not really intoxicated. A person accused of drunkenness by the police, without hesitation should insist on sending for an independent medical practitioner.

THE Buda-Pest Automobile Exhibition, which is housed in the imposing Government Industrie-Halle on the outskirts of the town, was opened on the 7th inst. The Exhibition has been patronised by a number of representative European manufacturers, and the public have supported the show well since the opening day. Among the well-known firms which have stalls in the building may be enumerated the new French automobile firm of Delaunay-Belleville, whose exhibit covers no less than 200 square metres, whose automobile manufactures we mentioned in connection with the Paris and Olympia Exhibitions. The Wolseley firm have also a stall at which their motor cars and motor boats are exhibited, while among the Continental firms in evidence may be enumerated De Dietrich, Richard-Brasier, Bayard-Clement, while a number of Oldsmobile cars are also shown.

"THE Considerate Driving League" has now been formally inaugurated by the Hon. John Scott-Montagu, M.P.

COMMERCIAL POINTS.

WE have received the 1905 catalogue issued from J. C. Lyell and Co., which contains particulars of numerous useful motor car accessories such as lamps, lubricators, pumps, voltmeters, &c. This firm also stock motor clothing of various descriptions.

MR. CARNEGIE is a firm believer in automobilism. For special use at Skibo Castle and touring through Great Britain he has just ordered a 24-h.p. Argyll car.

HIS HONOUR JUDGE EMDEN, who is one of those judges who take a commonsense view of the automobile law, has just, we learn, taken delivery of his second M.M.C. car.

THE GAEKWAR OF BARODA, whose trophy was secured in the Delhi Bombay trials by a De Dietrich car, has upheld the award of his Cup by securing a 24-h.p. car of this make from Messrs. Charles Jarrott and Letts, Limited.



On the visit to Italy which formed part of the German Emperor's Mediterranean tour, automobiles were placed at the disposal of himself, the Empress, and suite by the King of Italy, and of these His Imperial Majesty made very extensive use. The illustrations for which we have to thank the "Allgemeine Automobile Zeitung" show (from the top downwards) (1) the arrival of the Emperor in a Fiat car at Altamura, (2) the Fiat car used by the Emperor in Altamura, and (3) the Emperor, having breakfasted in the special express train, about to take his place in the automobile, the Emperor being in travelling dress; by the car is Adjutant V. Chellius.

MESSRS. R. D. ALDER AND CO., of 41A, Balham Hill, and 3, Rectory Grove, Clapham, notify us that they have been appointed sole agents for Surrey for the sale of "Radoline," a liquid hand-cleanser.

THE Aberdeen Town Council have placed an order with Messrs. Merryweather for a petrol motor hose carriage for the use of their fire brigade. The apparatus will also include a 35-foot telescopic ladder, and there will be accommodation for six firemen.

A 12-H.P. car, which is the first of a new type, has just been turned out from the Duryea works in Coventry, and is now on its way to Australia. Embodied in it are several new features that have been specially designed to the order of these makers' Melbourne agents, so that the trial run which was made with it immediately it was completed has been watched with interest. The total distance covered was between 240 and 250 miles, the route selected being from Coventry to Chester by one route, and back again immediately by another. By an unintentional detour, a considerable distance was traversed amongst the Welsh hills, but in spite of this the entire run was completed without once using the low gear. The only involuntary stop appears to have been one for adjusting the clutch. The average speed was well up to legal limit, and no excessive speeds were at any time indulged in. The fuel consumption was found to work out at between 22 and 23 miles per gallon.

Saxon Motor Company, Limited.—At a general meeting of the members of this Company, it has been resolved to wind same up.

Chase Motors, Limited.—The shareholders of this Company, at a special meeting convened, have determined to discontinue the business, and wind up the Company voluntarily.

NEW COMPANIES REGISTERED.

General Motor 'Bus Syndicate (Limited), 11, Abchurch Lane, E.C.—Capital, £10,100 in 10,000 ordinary shares of £1 each, and 2,000 deferred shares of 1s. each. Amongst the objects are to adopt an agreement with Sir Frederick Frankland, Bart.

Marine Motor Club of Great Britain and Ireland (Limited), Dudley House, Southampton Street, Strand, W.C.—Registered with 20 members, each liable for £1 in the event of winding up.

Martini Automobile Company (Limited).—Capital, £150,000 in £1 shares. Object, to acquire the business of Messrs. F. Martini and Co. (Limited), of Switzerland.

McNeill, Hutchinson and Co. (Limited), Bury New Road, Manchester.—Capital, £10,000 in £1 shares (1,000 deferred). Formed, to carry on the business of motor car, lorry, and launch makers, &c. First directors, J. Harvey, W. Mills, G. Cornille, W. McNeil, J. W. Tabiner, and H. Hutchison.

Michelin Tyre Company (Limited).—Capital, £60,000 in £10 shares. First directors, A. Michelin, M. Wolff, H. Vacherot, E. H. Coles, and J. Burbridge, all permanent.

John I. Thornycroft and Co. (Limited).—The report of the directors, which will be submitted at the annual general meeting on Tuesday next, shows a trading profit for 1904 of over £27,000. The directors recommend a dividend at the rate of 3 per cent. per annum on the ordinary shares. They point out that the profits derived from the new businesses acquired have barely paid interest on the additional capital represented, due in the case of the motor vehicle business to a temporary slackness in trade from August to November last year, and to the changes in motor legislation. The marine motor business has made satisfactory progress, and has justified the expenditure incurred in opening up this new branch of the business.



BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, Temple Bar, London.

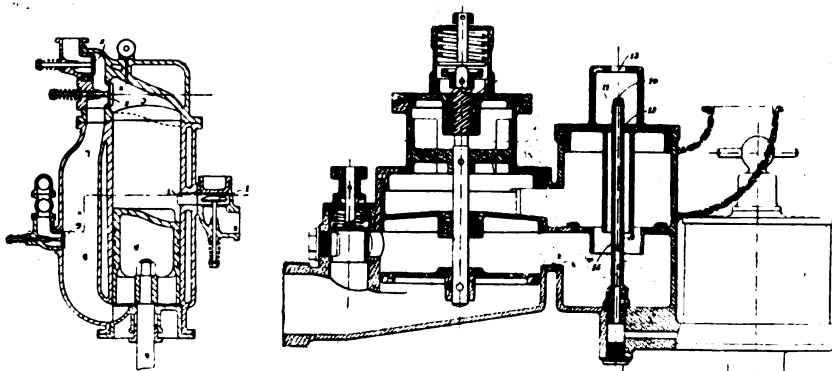
The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

29,412. 31st December, 1904. Improvements in connection with Carburetors for Internal Combustion Engines. Louis Renault, 139, Rue du Point du Jour, Billancourt, Seine, France. Date under International Convention, 14th December, 1904. In this improved carburetor an arrangement is provided whereby the height of the normal or first acting nozzle is decreased, and the second aperture begins to work only when a high vacuum has been created in the carburetor. There are two figures. Fig. 1, is a sectional elevation. The petrol-nozzle has two apertures, 9, being the normal aperture, and 10, the other or second aperture, provided at the top of the spraying-nozzle which extends upward into a chamber, 11. Between the spraying-nozzle or tube, 15, and a port provided in the bottom of the chamber,

11, has for its object the retardation of the flow of liquid through the aperture, 10. In practice, the ratio of the area of the annular passage, 12, to the area of the port, 13, is such that the liquid can only flow through when the additional air inlet is open.—April 26th, 1905.

10,744. 10th May, 1904. Improvements in Internal Combustion Engines. William J. Crossley and James Atkinson, of Crossley Bros., Ltd., Openshaw, Manchester. The object of this invention is an improved construction of an internal combustion engine giving an impulse every revolution and operating with greater certainty and economy. There are three figures. Figure 1 is a horizontal section of the cylinder in a central plane. The piston, A, is connected in the usual manner to the

sweep by the admission valve, E. The admission valve, E, is mechanically operated once during each revolution, being opened about the time that each working stroke is completed, and closed when the piston has travelled a short distance on its return or in stroke. The ignition point, H, is placed close to the admission valve, E, the surface of the cover of which tapers away to the valve by a passage called a spiral passage. The engine is governed by controlling the extent of opening of the gas suction valve, G. The exhaust passes through the port, I, in the cylinder uncovered by the piston, at the end of the stroke. It is controlled by the valve J, in the valve box, K. The distance between the admission valve, E, and the gas valve, G, in the reservoir, D, ensures that a considerable quantity of air enters the cylinder before any gas enters. The charge is expanded to rather more than its original volume. April 26th, 1905.



11, through which port the nozzle passes into the chamber, is an annular passage, 12, having a definite area in cross-section. The chamber, 11, has also at the top a port, 13, the area of which is larger than that of the annular passage, 12. When a vacuum is formed in the carburetor a certain quantity of air enters through the port, 13, and the annular passage, 12. As the area of the port, 13, is greater than that of the passage, 12, a predetermined ratio between the vacuum in the chamber, 11, and that existing in the carburetor may be secured. This ratio is so chosen that the liquid fuel issues through the opening, 10, only under predetermined conditions. In other words, a partial vacuum produced in the chamber,

piston-rod, B, which passes through a gland at the cylinder end. The other end, C, is the working and combustion end. The gland end of the cylinder by the reciprocation of the piston, A, serves as a pump for drawing in the charges of gas and air and delivering them to the working end, C. The gland end of the cylinder is in free communication with reservoir pipe, D, connecting it to the admission valve, E, to the working end, C, of the cylinder. The reservoir, D, has a capacity about equal to or a little larger than the displacement of the piston. Opening into the reservoir, D, are two automatic suction valves, one, F, for the admission of air, placed beyond the admission valve, E, so that the air in its passage

Patent Specifications Published.

Applied for in 1904.

Published May 18th, 1905.

- 9,409. H. S. HELE-SHAW and others. Wheels.
- 10,892. R. HAGEY. Friction gears.
- 13,494. A. E. L. CHORLTON. Int. combn. engines.
- 13,663. D. ALBONE. Attachment of mowers and like implements to motor tractors.
- 13,746. T. U. GRAY. Int. combn. engines.
- 13,905. J. C. MERRYWEATHER. Automobile fire-extinguishing apparatus.
- 14,153. A. HELMER. Seats.
- 14,251. H. LIGHTBAND. Tyre cover.
- 21,704. E. SHUKER. Hydraulic governor.
- 29,411. L. RENAULT. Carburetors.

Published May 25th, 1905.

- 2,270. T. W. BARBER. Motor vehicles.
- 9,589. P. V. A. CHEZARD. Motor vehicles.
- 9,892. R. CRAIG. Motors.
- 9,949. E. SOLLER. Speed gear.
- 9,994. H. S. HELE-SHAW. Friction clutches.
- 10,168. H. G. GIFFARD. Explosion engines.
- 10,335. F. HUMPHRIES. Steering gear.
- 16,400. E. D. DE LIEBHABER. Dust prevention.

Applied for in 1905.

Published May 18th, 1905.

- 1,939. A. LOVAL. Radiators.
 - 3,925. A. MANS. Springs.
- Published May 25th, 1905.
- 4,062. T. F. RENE. Sparking plugs.

The Automotor Journal, May 27th, 1905.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

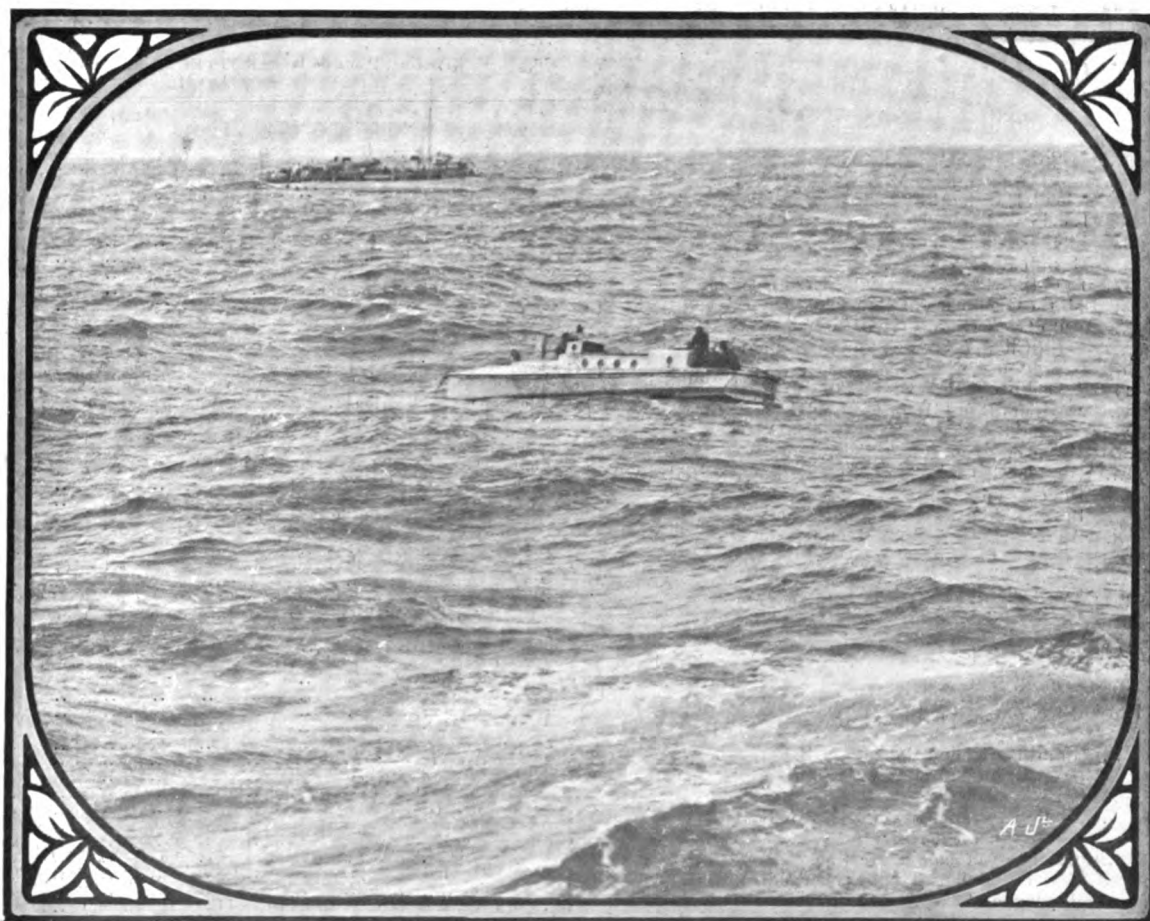
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MAY 27TH, 1905.

[Registered at the G.P.O.]
as a Newspaper.

[Weekly, Price 3d.
Post Free, 3d.]



Madame du Gast's motor boat Camille in distress during the Algiers-Toulon Race. This interesting photograph was taken from the deck of the Cruiser, Kléber.

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NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C., by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

1905.		
May 30 ...	*Gordon-Bennett British Eliminating Trials.	
May 31 ...	Auto Cycle Trials and "Selection" Race.	
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.).	
June 10 ...	London-Edinburgh (Motor Cycling Club).	
June 12 ...	Filey Sands Races (Yorkshire A.C.).	
June 14 ...	Bexhill Race Meeting.	
June 24 ...	100 Miles Passenger Trial (Motor Cycling Club).	
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).	
July 8... ..	Auto Cycle Club Consumption Trial.	
July 12 ...	*Hill-Climb (Henry Edmunds Trophy).	
July 19-22 ...	*Brighton Speed Races.	
July 27-28-29	*Blackpool Motor Meeting.	
July	24 Hours Run (Motor Cycling Club).	
Aug. 2-3. ...	*Motor Boat Trials (Southampton).	
Aug. 11 or 18	*Quarterly 100 Miles Trials.	
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.	
Aug. 26 ...	Inter-Team Trial (Motor Cycling Club).	
Sept. 9 ...	Brown Cup (Motor Cycling Club).	
Sept. 12 ...	Auto Cycle Club Race Meeting.	
Sept. 14 ...	*Tourist Trophy (Isle of Man).	
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).	
Sept. 20, Oct. 24	*Van Trials.	
Oct. 4 ...	*Speed Trials.	
Nov. 10 or 17	*Quarterly 100 Miles Trials.	
Nov. 17-25 ...	Society of Motor Manufacturers and Traders Exhibition at Olympia.	

Foreign Events (Trials, Races, &c.).

1905.		
June 16 ...	French Selection Race for G.B.	
June 23 ...	International Motor Cycle Cup.	
June 20-28 ...	Aix-les-Bains Week.	
July 1 ...	Boulogne-Cape Gris-Nez (Motor Boats).	
July 5 ...	Gordon-Bennett Race.	
July 9-22 ...	Ostende Automobile Meeting.	
July 11 ...	Start for Glidden Trophy (New York).	
July 15 ...	Boulogne-Folkestone (Motor Boats).	
July 16 ...	Mont Cenis Hill Climb.	
July 20-26 ...	Paris to the Sea (<i>Journal de L'Automobile</i>).	
July 28-Aug. 8	Paris Industrial Vehicles Trials (A.C. France).	
July 27 ...	Gaston Menier Cup (Motor Boats).	

* Automobile Club of Great Britain and Ireland Events and Papers.

July 31 ...	Anthony Drexel Cup (Motor Boats).
Aug. 6-7 ...	Circuit des Ardennes.
Aug. 10-16 ...	Herkomer and Bleichroder Races.
Aug. 12 ...	International Cup for Motor Boats.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Tri-Car Competition (<i>L'Auto</i>).
Sept. ...	Vincenzo-Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.
Sept. ...	Tourist Car Trial (A. C. de France).
Sept. 3-10 ...	Royan Meeting.
Sept. 3-10 ...	Spa Automobile Club.
Sept. 11 ...	British International Cup (Motor Boats Arcachon).
Sept. 12-14 ...	Lake Lucerne Motor Boat Meeting.
Oct. 1 ...	Chateau Thierry Hill Climb.
Oct. 15 ...	Gaillon Hill Climb.

"The Automotor Journal" can be obtained from all Messrs. W. H. Smith & Sons, and Messrs. Willing & Co.'s Bookstalls. All Railway Stations throughout France, and at

AIX-LA-CHAPELLE, J. A. Mayer, Eisenbrunnen.	MADRID, Editores Romo, Calle de Alcala 5.
AIX-LES-BAINS, A. Gerent, 32 Rue de Genève, and F. Mabboux, Place du Revard.	MARIENBAD, E. A. Gotz, Buchhandlung.
BADEN BADEN, Otto Ryssel, 42 Lange Strasse.	MARSEILLES, Mme. Bayle, 1 Rue de Noailles, and H. Blancard, 17 Rue Paradis.
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LUCERNE, F. Eisenring, Place de la Chapelle.	

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PASSING EVENTS.

More Ways than One of Solving a Problem.

SOME day the human race will be able to fly, there can hardly be a doubt about that, whether it is by their own power or by mechanical means. But there are probably at least two ways in which the problem will be solved. That is, as regards flight in its true sense, *i.e.*, the maintenance in the air by mechanical means of bodies inherently heavier than air. To the navigable balloon we do not at present refer. Hitherto attempts to solve the problem of flight have made use of the aeroplane and propeller principle—the propeller providing the push and the aeroplane, curved at a relatively small angle to the air, providing the lift. But there is another method by which the problem may be solved. But, so far, there has only been one type of practical flying machine—the type of machine presided over and managed by the bird. There is also the arrangement adopted by the bat, but that only differs from the principle used by the bird, in employing a smooth winged surface instead of a feathered one. By the bird principle, we mean in general the use of the flapping wing as a source of power. Flapping wing flight has been comparatively little studied, but flapping wing flight has its merits, as is sufficiently evinced by the fact that flapping wing flight has proved itself to be hitherto the only successful method of aerial locomotion. The subject is consequently worth studying. Some experimenters at Cambridge have been studying it for some time past, and they have obtained very interesting results, which we embody in a separate article on another page. These results lead to the conclusion that flapping wing flight may prove itself a more successful method of solving the problem of aerial locomotion than has hitherto been supposed. At the moment, however, it must be recognised that the results of the Cambridge experimenters do not carry us a great way, nothing approaching free flight having been attempted, though the power of artificial wings has been clearly demonstrated. But even this is an interesting and important result, as far as it goes.

A Fair Fight and no Favour.

MR. SCOTT MONTAGU is withdrawing his blocking motion in time to enable the debate on the whole motor car question to be opened and carried through to a conclusion on Thursday in next week. It is the proper policy, and motorist Members of the House of Commons, including those who have been recently converted to the importance of the new locomotion, or, in other words, the automobile interest in the House, is stronger now than ever it has been before. The numbers of the opponents are, we believe, practically constant, though they make up in increased fanaticism and the adroitness with which they seize every opportunity afforded for self-advertisement for what they lack in numbers. It is an excellent thing that the opposing forces should meet in the clash of debate now, when the next opportunity for legislative interference with the industry on the part of Parliament is still a considerable distance ahead. It will be a dress rehearsal, or to use a more topical metaphor, a reconnaissance in force, of the opposing interests, and it will enable us to judge of what our prospects are likely to be when the next Automobile Bill comes up for discussion. It should accordingly be fairly instructive,

and will enable those interested in the future of the movement to judge to what extent further propagandism amongst Members of Parliament would be needed before the great Armageddon is fought out. Of course, to some extent, conclusions will be discounted by the possibility that a General Election may take place before another Automobile Bill is introduced. Without going into the question of politics, the effect of a General Election intervening should be beneficial rather than otherwise to the automobile interest—if only automobilists will pull together. We have pointed out many times what an enormous weapon the value of the automobile at election times places in their hands. We would once again point out, as we shall probably point out many times more, that if the owners of automobiles will only place the interests of the industry and the pastime above relatively futile political considerations, they have the future in their own hands. Let them exact from every intending Member of Parliament a solemn pledge that he will oppose reactionary legislation, and favour legislation beneficial to the movement, before they put their cars at his disposal. Let common sense prevail!

Surgit Amari Aliquid!

SOME years ago, arrangements were made for holding a speed contest along Earl de la Warr's Promenade at Bexhill. Everything had been arranged for, and both the automobilists of the United Kingdom, the citizens and innkeepers of Bexhill, and the public generally, which likes to see sport, witness high-speed contests, and judge of what progress in a particular department of industry means, were preparing to throng to the scene of the intended competition, when there uprose in his majesty one Mayner, a retired jobmaster, who applied to the Court of Chancery for an injunction to prevent the speed-contest taking place. And so the meeting, which everyone was looking forward to, was not held. For strict law was on Mr. Mayner's side, and Mr. Justice Farwell interpreted it as he recently interpreted the strict law in regard to Stonehenge—to the disadvantage of the public.

These recollections of an unpleasant episode are called to mind by a letter which has appeared in the *Sussex Daily News* over the signature of Mr. Alfred Hallett. Mr. Hallett seems to be aspiring to much the same position in Brighton that Mr. Mayner so efficiently assumed in Bexhill. With the difference that whereas Mr. Mayner had the courage of his opinions, and took legal action on his own account, Mr. Hallett seems more disposed to leave such action to others—his attitude being rather that of the schoolboy who gave the sardonic advice, "Don't nail his ear to the pump." Mr. Hallett is very angry with the Brighton Corporation for the expense which they are incurring for the purpose of putting the Madeira Walk in proper condition for the speed contests to be held. He seems to think—the argument is the usual one of all reactionaries—that if the dedication of the Madeira Walk to speed contests goes unchallenged, the principle will be carried further, and that the next step will be to arrange similar competitions on the Marine Parade. This is, of course, supreme nonsense. The Madeira Road is a special tract won from the beach, and set apart for the use of bath-chairs, invalids' carriages, and bicycles. It is not a road that leads to any of the business parts of the town. In fact, there is less objection to a meeting

of the kind proposed than even in the case of Southport, and there is no doubt that the result of the meeting will be to benefit the town, which, after all, is not a productive or manufacturing centre, but exists mainly on its visitors and tourists. Under the circumstances, therefore, it is to be sincerely hoped, both for the sake of the town itself, and the automobile interests concerned, that there will be no merely fractious opposition. That kind of thing, after all, does nobody any good, and the notoriety obtained by it is far from enviable.

♦ ♦ ♦

Complimentary but not Gratifying.

WE have always recognised the compliment paid us by many of our American contemporaries in excerpting both descriptive articles, and even *editorial* comments, from our pages. We would have felt a more profound degree of satisfaction had these loans, borrowings, or *emprunts* been accompanied by some recognition of their source. That however is, it seems, too much to look for from across the Atlantic. Where attempts are made to disguise the source of inspiration, by avoiding actual reproduction *en masse*, we are at times able to admire the ingenuity displayed, but even this consolation is occasionally lacking. It is so, at any rate, in a recent case where our descriptive article dealing with the Wolseley heavy oil vaporiser is concerned. We recognise, with some emotion, our own drawing in the pages of the esteemed American contemporary in question, but regret to say that it is—by way of “difference”—reproduced *upside down*. On the whole we would have preferred that it had been reproduced the right way up, even though inversion may be an ingenious labour-saving method of informing the world in general that the Wolseley vaporiser could work equally well in that position.

♦ ♦ ♦

Street Obstruction.

THE total anarchy that prevails amongst the authorities on whom Parliament, with doubtful wisdom, has conferred the right of tearing up the streets of the Metropolis, where and when it seems good in their eyes, is a subject to which we have often, in common with other journals, drawn attention to. It is practically no exaggeration to declare that many of the principal thoroughfares in the Metropolis are scarcely free from the depredations of one public body when the labourers of another march on to the ground, and commence tearing up the surface almost before it has had time to harden after the last onslaught. How preposterous the whole thing is, however, has been forcibly brought out at a conference held recently by the Metropolitan Paving Committee. There are no less than thirteen different companies or bodies empowered to tear up the principal streets when it suits their convenience, and it has been recently proposed to add a fourteenth to the number. They take no trouble whatever to co-operate with one another so as to conduct their operations simultaneously, and the result is that in the City of Westminster, in a single year, streets have been opened and trenched no less than 11,000 times. Surface boxes have been opened, causing a certain amount of obstruction, from 300,000 to 400,000 times, and there have been other cases of more or less serious obstruction, variously estimated as being from 6,000 to 8,000 in number. These figures only apply, it must be remembered, to a single municipality of the Metropolis, so what the preposterous total may be we leave to the imagination of our readers. The subject has been discussed, but few practical means of

relief have been suggested. The most promising is an extended application of the subway principle. Thus it has been pointed out that where subways exist, as in Shaftesbury Avenue, Charing Cross Road, and the Thames Embankment, there is but little tearing up of the road surface. To compel these thirteen or fourteen bodies to amalgamate, and jointly construct subways, would therefore be a beneficent provision for Parliament to enforce. But possibly this is to some extent a counsel of perfection. In the meantime, it would perhaps go some way to mitigating, though not eradicating, the intolerable nuisance if a certain amount of co-operation between the street up-rooting bodies were insisted upon, and that, for instance, where the water company wants to tear up the street, the electric lighting company should receive notice, with the information that any repairs they wanted to execute must be done then, or otherwise they would not be permitted to effect them for another six months or a year. From the point of view of those interested in traffic facilities the subject has long been nothing less than a public scandal, but from the ratepayers' point of view it is almost worse, for these unfortunate victims of the prevailing anarchy not only have to incur the inconvenience and loss of business due to having the access to their premises interfered with, but they are charged heavily in increased rates in many instances for the very operations which have already caused them considerable financial loss.

♦ ♦ ♦

Alcohol in Theory and Practice.

THERE can be no doubt that the dinner and discussion organised by the Society of Motor Manufacturers in regard to the alcohol question has had a beneficial effect. It has concentrated attention on an important industrial problem and one with which the prospects of the automobile industry may possibly become bound up to a very considerable extent.

In another place we give a *résumé* both of the paper which was read by Dr. Ormandy, and the discussion—sometimes rather critical—which it evoked, and in which several speakers, universally recognised as authorities on the subject, took part.

Dr. Ormandy, who was invited by the Society to read a paper on the subject, has come to be recognised as the protagonist of alcohol—we mean of course in its industrial application. He at once raised the question to a high level. It is to the future rather than to the present that Dr. Ormandy looks. The question of freeing alcohol designed for industrial purposes from legislative restrictions is one which cannot but be of considerable importance to automobilists. It may be a long time before it is a matter of moment, for the best authorities on the subject are quite in doubt as to what the present output of petroleum spirit is, and the price of petroleum spirit is one of the determining factors in the situation. That its present low price—in large quantities and under wholesale conditions—is a “competitive” figure is practically certain. How long this figure will be maintained is doubtful in the extreme, and it depends, amongst many things, on how the great oil industries choose to run their works; for they can afford to lose on one product and make more on another, if it suits their purpose, for a very long period of time. But that period has its limits, and one of the things that might limit it very quickly, as Dr. Ormandy pointed out, is a foreign war. Petroleum spirit is above all things a foreign product, and were this country at war with a first-

class naval power, petroleum spirit would be at famine prices in a moment. In such a case, if automobilists had trained themselves to use a product which *can* be manufactured at home the situation would be greatly ameliorated. And it is really for this reason that Germany, and possibly France, have devoted so much attention to the alcohol question. Germany has promoted the application of alcohol to motor propulsion for precisely the same reasons as she is protectionist—in order, viz., that she may to some extent at any rate be independent of foreign sources of supply—that is perhaps the kernel of the whole question, though next in importance no doubt is the consideration that a moderate employment of alcohol for motor propulsion would render us similarly independent of the financial operations of the great oil companies. The price of alcohol would limit the price to which they could ever run up the price of petroleum spirit.

Dr. Ormandy was particularly instructive on the advantages of alcohol as a fuel compared with its principal competitor, ordinary paraffin oil. With the latter, it only shows one defect in common—the difficulty of starting cold—though this is not a very serious matter. But under existing conditions, with the motor properly designed for its consumption, the unpleasant smell which once was characteristic of the employment of alcohol has been practically eliminated, and in that respect it is now preferable to paraffin. All the troubles, in fact, of destruction of valves and passages by corrosive products of combustion were due, apparently, to imperfect carburation and insufficient compression, resulting in inadequate combustion, giving rise to the production of aldehydes and acids instead of carbonic acid and water, which ought to be the only final results of alcoholic combustion.

The Reverse of the Medal.

THE other speakers, however, who took part in the discussion adopted, almost unanimously, the view that alcohol as a fuel for internal combustion engines is scarcely a question of practical politics. There is no doubt that the demand for petroleum spirit will increase, and is increasing, with great strides, but at the same time it must not be forgotten that distinct progress has been made in adapting the denser forms of spirit satisfactorily for use, and it is quite possible that the rise in the specific gravity of the petroleum spirit supplied, which is almost certain to accompany the increased demand, may be so gradual as to enable the ultimate successful employment in internal combustion engines of hydro-carbons differing little, if at all, from ordinary paraffin lamp oil.

On the other hand, there does not seem to be a great prospect of the price of alcohol being seriously reduced to such an extent as to make it a really cheap fuel, however Inland Revenue restrictions may be abrogated. As a fuel, and compared with paraffin oil, alcohol has no advantages which are not discounted by equally serious disadvantages, so that it is mainly on the question of cost, and the possibility of making it a home product, that the development of the alcohol motor depends. At the present time, alcohol costs about twice as much as petrol, and even if the taxes on it were removed, and its home growth encouraged, it would probably have no advantage in price. Neither does the cultivation of the land hold out much temptation, for it would appear as if land, in England at any rate, is far too valuable to use

for the purpose. It is true that the alcohol engine can be made more efficient than the petrol engine, and that only 20 per cent. of the available mechanical equivalent of the fuel is converted into work in the petrol engine, whereas some 30 per cent. of the energy contained in alcohol is rendered available. But the effect of this is much more than neutralised by the inferiority of alcohol as a fuel, it having little more than half the calorific value of petroleum spirit. Whatever difficulties may have been experienced in alcohol engines, they can, no doubt, be got over without difficulty by suitably designing the engine and the carburettor. But, no doubt, at present prices, there is little inducement to manufacturers to put such engines on the market.

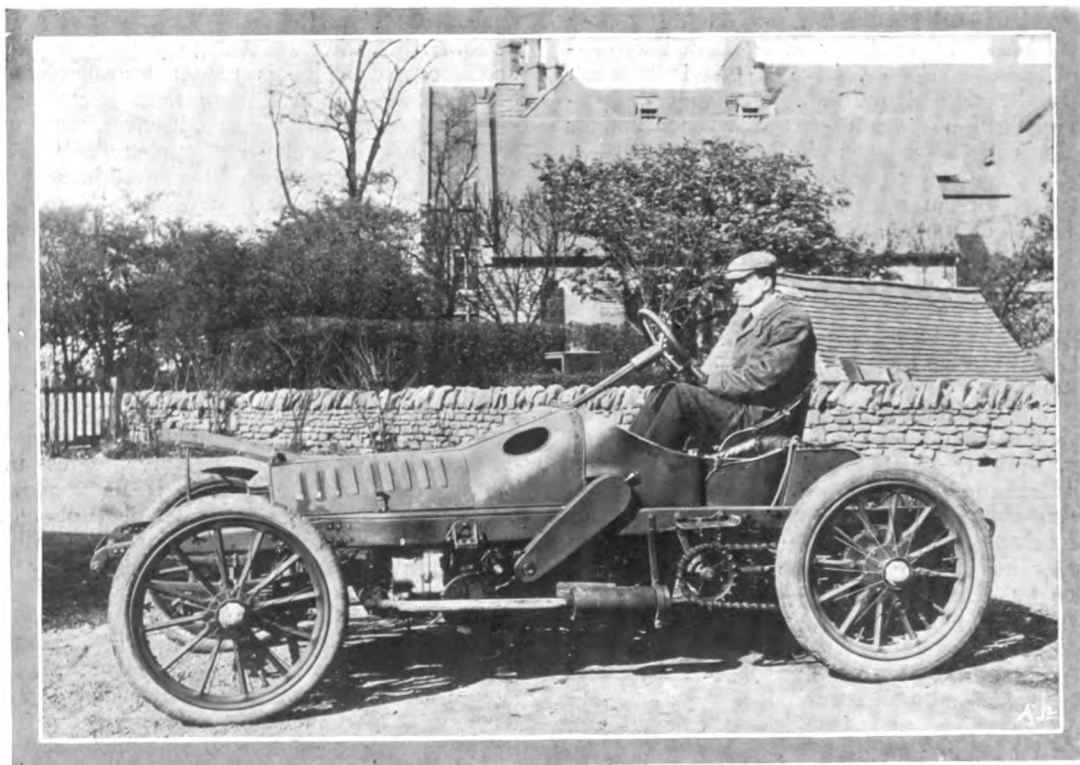
On the whole, therefore, it would seem that the balance of probability is in favour of the views of those authorities who look upon the extended employment of alcohol for automobile purposes as a subject that, at present, is not a very pressing one. If, in the future, we find that the price of petroleum spirit goes up enormously, and that satisfactory progress in utilising the heavier oils instead of it is not made, then the question of the general employment of alcohol will become an important one, but it will hardly become important until that day is much more nearly in sight.

A Trust for English Canals.

IT is satisfactory to find that the movement in favour of commercially and industrially rehabilitating the great system of waterways which the country still possesses in its network of canals, has entered upon a further and important stage of development. A trust is being organised for purchasing and amalgamating the most important of them, and a Bill is being promoted to confer Parliamentary powers upon the trust to carry out the amalgamation and, if need be, compulsorily purchase some of the principal canals. The trust is to be composed of a chairman, vice-chairman, and thirty-seven trustees, of whom no less than twenty-one will be appointed by the Treasury, the Board of Trade, and the Board of Agriculture and Fisheries in equal proportions. An interesting provision of the proposed Bill is that no chairman, director, manager, or other official of a railway company shall be eligible for a seat of any kind on this Board, a significant reminder, if any were needed, of the attitude and past policies of the railway companies in regard to our waterways. There seems to be every reason to hope both that the suggested Bill will be passed through Parliament, and that the trust which will be thereby constituted will have adequate financial backing to develop the waterways which it is taking over. With the development of the motor boat and the motor barge, and bearing in mind the very satisfactory results that have been obtained in canal haulage by self-propelled tractors in place of horses, and the wide field which a satisfactory amalgamation of our great canals would open to aquatic automobilism, this canal trust and self-propelled water traffic ought to work hand in hand to their mutual advantage, and we therefore wish the project every possible success.

A SCHEME for providing throughout inner London a service of automobile ambulances is now being worked out by Sir William Collins and other members of the London County Council, and it is hoped that the scheme will be accepted at an early date, so that the new ambulances may be at work within the next three months.

GORDON-BENNETT CUP RACE.



GORDON-BENNETT RACERS.—Our illustration shows the Hon. C. S. Rolls seated at the wheel of the 90-h.p. Wolseley Car which he will drive in the Eliminating Trials in the Isle of Man next Tuesday. We have already given full particulars of this machine, which is a sister vehicle to that assigned to Bianchi.

British Eliminating Trials.—On Tuesday next the Eliminating Trials to select the representatives of Great Britain take place in the Isle of Man, when, as last year, the cars will be driven in an 8-hours' trial round the course. We give an outline map of the road, together with full distances between each section of the road. We also publish a list of the cars entered in the Trials, together with the leading par-

ticulars of each entry. As before there will be 5 controls, viz.,

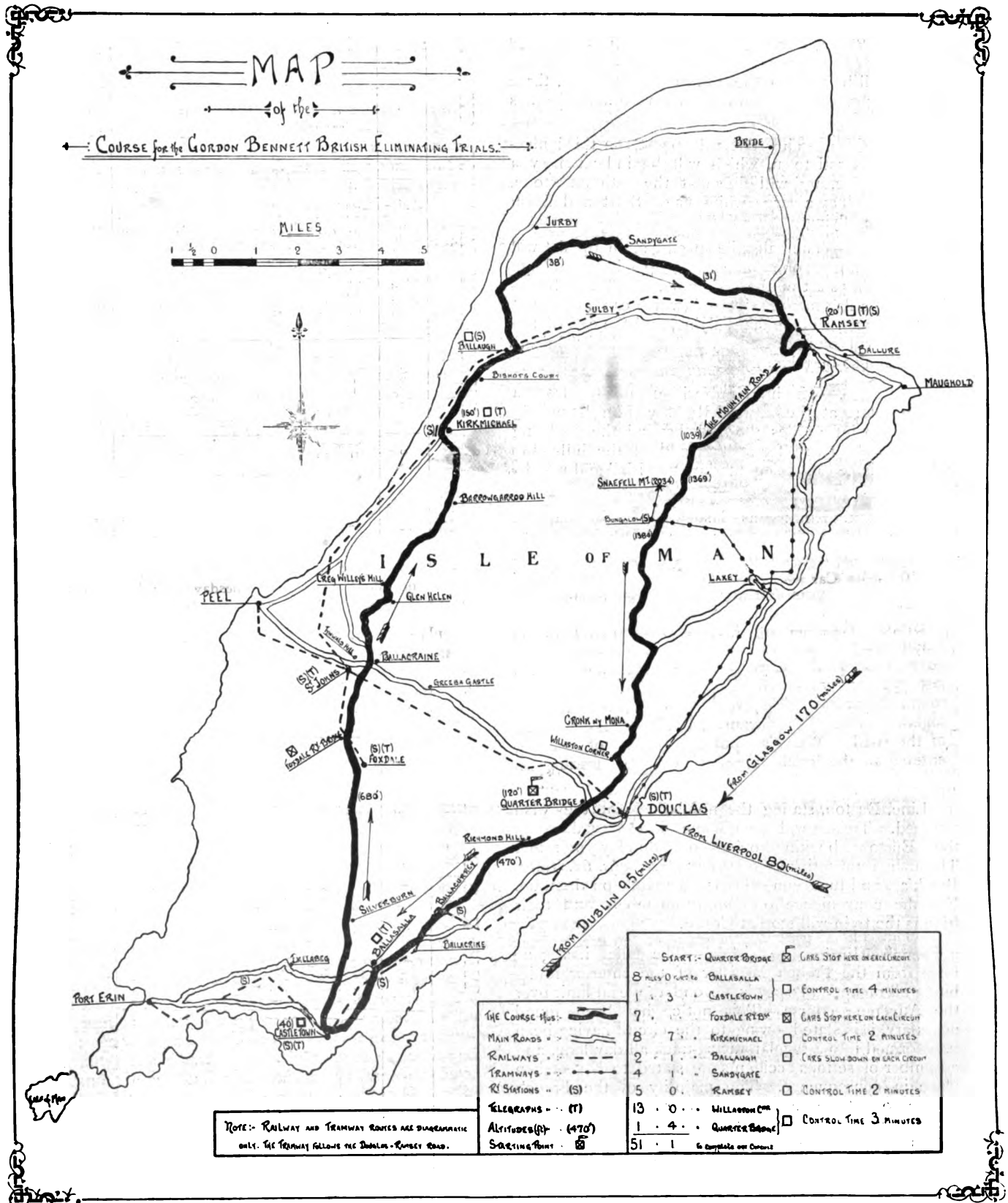
	Min. Time.
1. Ballasalla. 1 mile 3 furlongs	4m.
2. At the Railway Bridge, Foxdale. Stop and start.	
3. Kirk Michael. 4 furlongs	2m.
4. Ramsey. 4 furlongs... ..	2m.
5. Willaston Corner to Quarter Bridge, 1 mile 4 furlongs	3m.



Dhoon Glen, near Ramsey.

Laxey Water Wheel, a prominent feature in Manxland.

ISLE OF MAN ELIMINATING TRIALS.



The total distance of the circuit, as shown on our map, is 51 miles 7 furlongs. The Selection Trials, besides examination for general stability, and ensuring that every part of the car is made in Great Britain, and examination and inspection after the Trials, will further comprise during the 8-hours' run round the circuit, speed tests during each circuit.

There will be three of these in each circuit, viz., three miles straight, half mile on the flat, and about 2½ miles hill climb.

Three Miles.—The start will be at the third milestone from Castletown, which will be indicated by a large white flag, and will finish at the sixth milestone, also indicated by a large white flag. Start and finish will be taken flying.

Half Mile.—The half mile speed test on the flat will commence about one mile after passing Ballaugh Church. The start of the half mile, which will be indicated by a flag marked "start" (which can be seen at some distance), will be taken flying, and the end of the half mile will be indicated by a flag marked "finish," which will also be taken flying.

Hill Climb.—The hill climb will commence from a standing start at the outward Ramsey control, and will finish at a point 2 miles 480 yards beyond, the rise being approximately 1,019 feet. The end of the hill-climb will be indicated by a flag marked "finish," and will be taken flying.

MR. CECIL EDGE was last week unfortunate in having a mishap with his car near Cronkeberry, both he and his companion being shot out of the car into the hedge, marvellous to relate, neither sustaining any injury. The car was considerably damaged, and was at once shipped to London for the necessary re-adjustments in order to enable Mr. Cecil Edge to drive in the Trial.

Special Train.—The final arrangements have now been made for the special train on Sunday, May 28th. It will leave Euston at 9.15 a.m., and reach Liverpool in time to allow passengers to catch the special boat to Douglas at 2 p.m. Members and their friends who wish accommodation reserved for them would do well to send a postcard to Mr. Robert Turnbull, Superintendent of the Line, Euston, stating the number of seats they wish retained. Tickets will be obtained in the usual way at the Euston booking office on Sunday morning. Through return tickets 68s. first-class, 39s. 6d. third. Breakfast and luncheon will be obtainable on the train. For the convenience of country members and their friends the train will stop at Crewe.

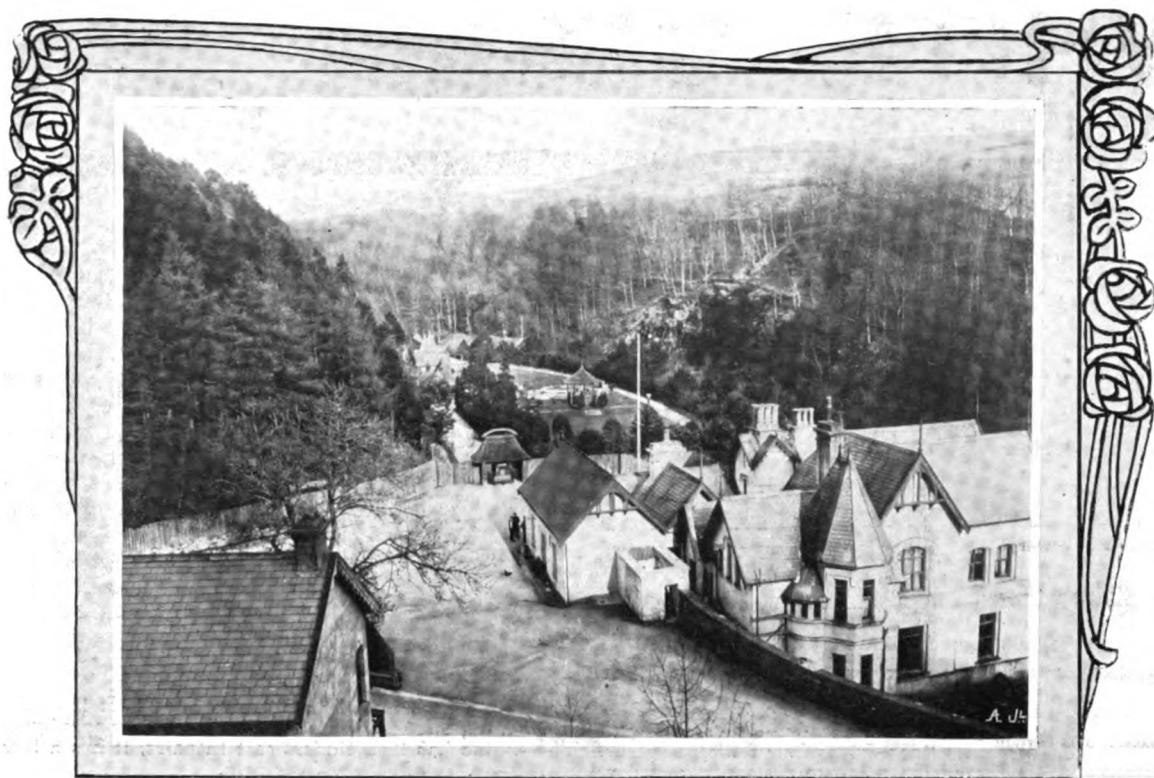
French Eliminating Trials.—The edict has gone forth from the French Minister of the Interior prohibiting all racing and speeds beyond the legal limit over the Auvergne course. This notice has been found necessary, it is stated, owing to the circuit having been transformed into a regular racing-track all day long, and a number of serious accidents are stated to have taken place in consequence. The majority of the French competitors have already been round the course sufficiently to have made them thoroughly acquainted with the special features of the road, and the best method of taking the greatest advantage at each turn and difficult point. Some have almost lived on it. It is sincerely to be hoped, therefore, in the interests of competitors of other countries, that a fair amount of

PARTICULARS OF THE RACERS ENTERED FOR THE BRITISH ELIMINATING TRIALS FOR THE GORDON-BENNETT RACE.

No.	Make.	Owner.	Driver.	H.-P.	Cyls.	Bore.	Stroke.	Ignition.	Transmission.	Speeds.	Tyres.	Wheel-Base.	Track.	Clutch.	Radiator.	Brakes.
12 7 6 9	Napier	S. F. Edge J. Hargreaves	A. E. Macdonald C. E. Edge J. Hargreaves	90 80	6 sep.	6½	5	Acc'trs.	Live-axle, 1 sliding member in gear-box.	2 3	— { 870 x 90 850 x 120 }	9 ft. 3 in. 8 ft. 10½ in.	4 ft. 7½ in. 4 ft. 7½ in.	Metal cone	{ Tube Honey'be }	{ 1 foot 1 hand }
4 11	Wolseley	H. Austin	C. Bianchi C. S. Rolls	90	4	7½	6	Acc'trs.	Chain, 1 sliding member in gear-box.	4	{ 32 x 90 32 x 120 }	9 ft. 1 in.	4 ft. 7 in.	Leather cone	Tube	{ 1 foot 1 hand }
10	Siddeley	L. de Rothschild	S. Girling	100	4 sep.	—	—	H.-T. mag. Acc'trs.	Chain, 2 sliding members in gear-box.	3	{ 32 x 3½ 32 x 5 }	9 ft. 1 in.	4 ft. 6 in.	Disk	Tube	{ 2 foot 1 hand }
3	Darracq	A. L. Guinness	A. L. Guinness	90	4 sep.	160	140	L. T. mag. Acc'trs.	Live-axle, 1 sliding member in gear-box.	3	{ 810 x 90 815 x 120 }	8 ft. 4 in.	—	Metal cone	Honey'be	{ 1 foot 1 hand }
1 2	Star	Sir A. Hickmann E. Lyle	H. G. Goodwin F. R. Goodwin	70	4 prs.	5½	6½	Simplex Acc'trs.	Chain, 2 sliding members in gear-box.	4	{ 34 x 90 34 x 120 }	9 ft. 3 in.	4 ft. 9 in.	Disk	Honey'be	{ 1 foot 1 hand }

(12) Electrolytically deposited copper jackets on steel cylinders.
(6, 7, 9) Cast-iron liners in aluminium jacket, heads cast separately in pairs.
(4, 11) Horizontal engine, cast-iron liners in aluminium jacket, heads cast separately.
(10) Crank-shaft has I section webs.
(1, 2) Hele-Shaw clutch. Hollow bolts.

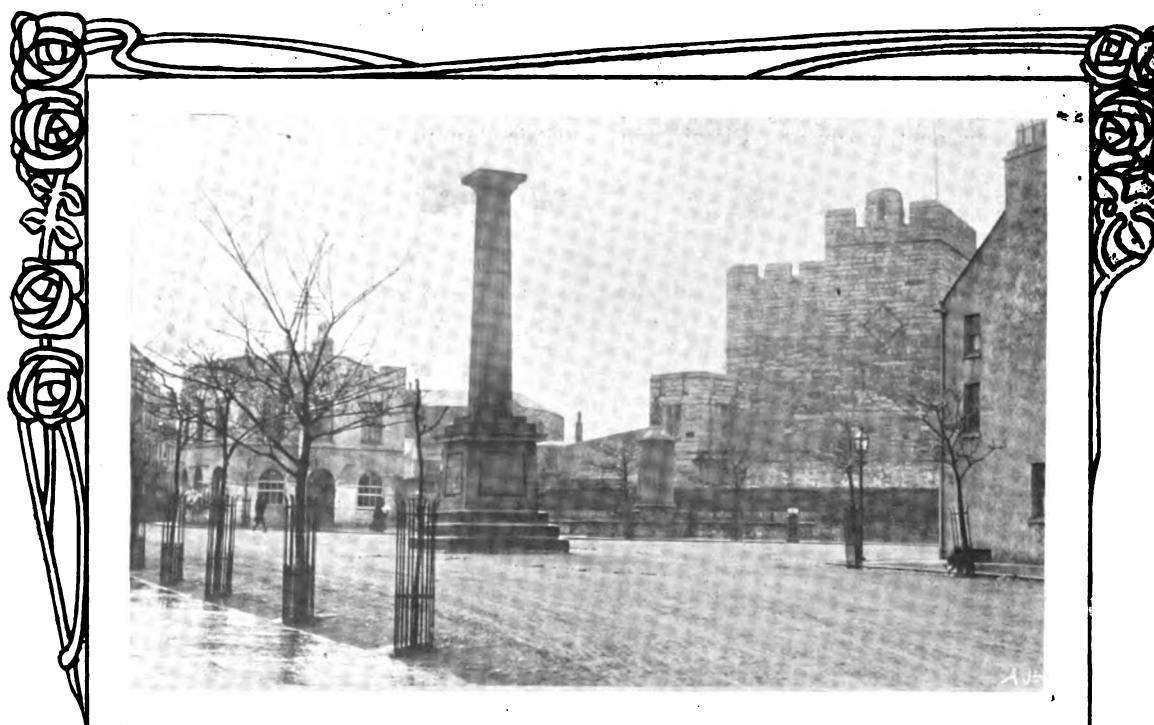
Special Features



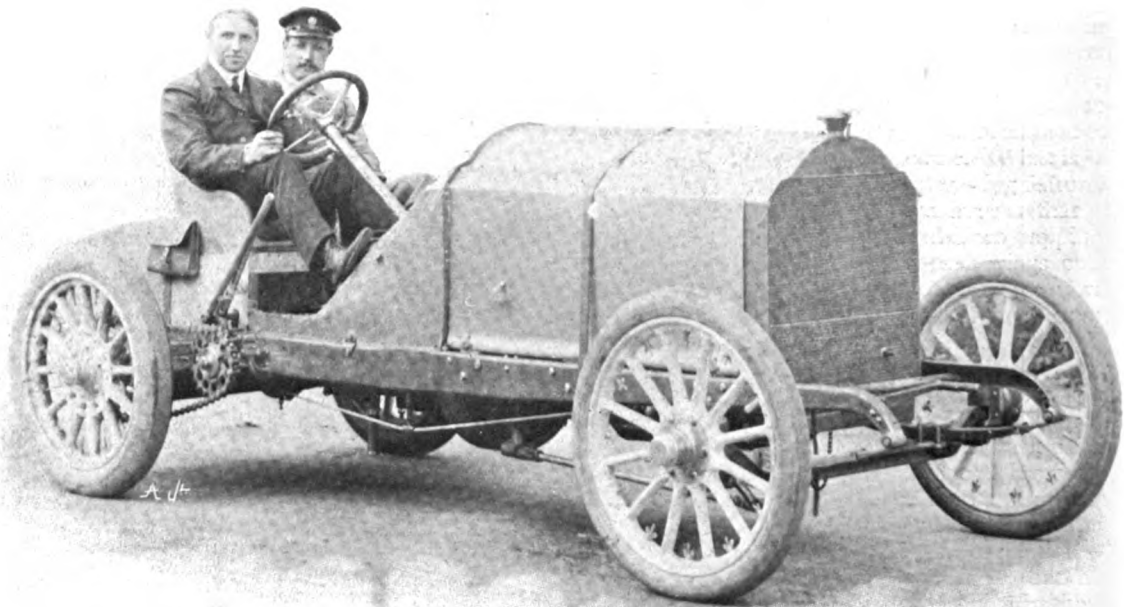
ISLE OF MAN ELIMINATING TRIALS.—Glen Helen.

time will be accorded by the French authorities prior to the actual race for the cup, to enable them to try their cars round the circuit in view of the facilities which have been accorded to the French competitors during the past month. Otherwise the French drivers will

have such an enormous advantage over those of other countries that it would be a most serious handicap for all foreign cars in the race, a position which we feel sure neither the French Club nor the French Government would care to have criticised in the event of



ISLE OF MAN ELIMINATING TRIALS.—Castletown, the southern point of the road.



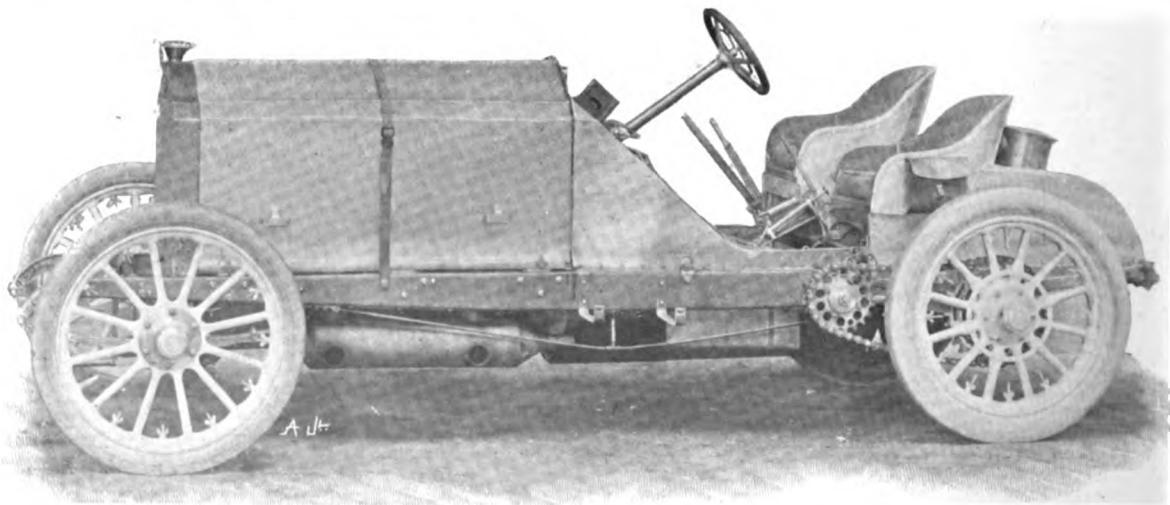
GORDON-BENNETT INDEX.—The 120-h.p. De Dietrich Car, which is to be driven by Duray. It is of the chain-driven type, has an enormous 4-cylinder engine (bore 190 mm., stroke 150 mm.), and the change-speed-gear—designed on Mercedes lines—gives four forward speeds. The engine has its cylinders cast in pairs, it has a low tension magneto system, and it develops 120-h.p. at 1,200 revs. per min.

French drivers being successful under the circumstances in holding the Cup for another year.

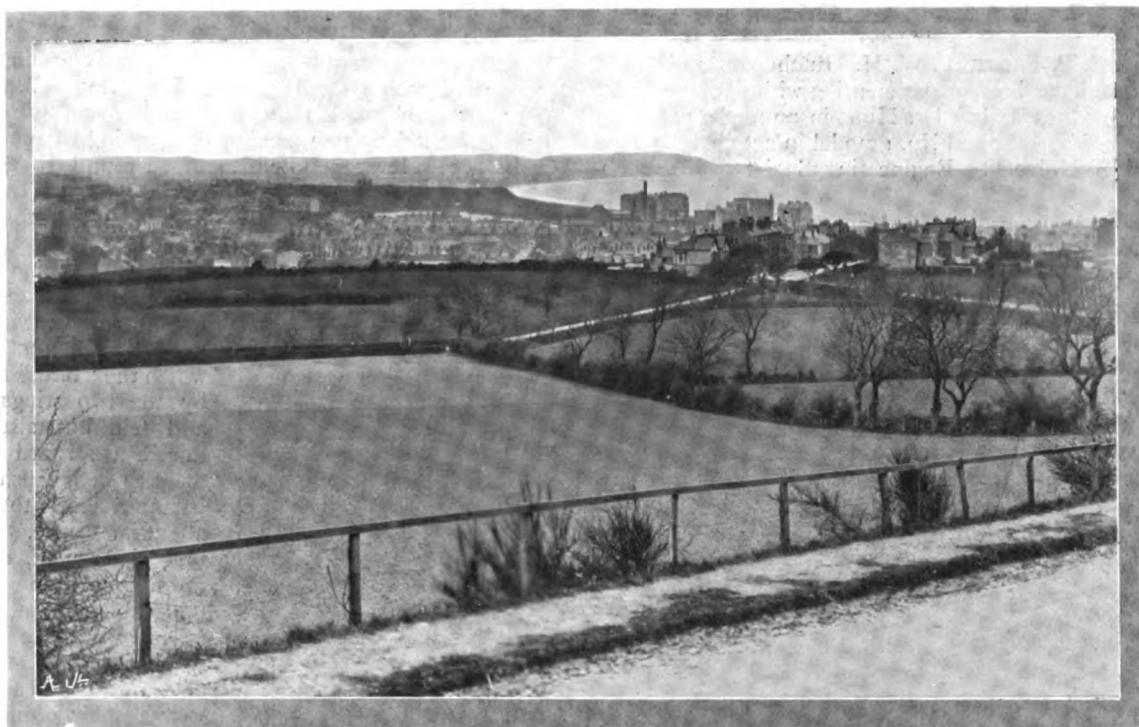
In regard to the "halts" in the Eliminating Trials insisted upon by the Government, it has been decided by the French Club that no replenishment stores shall be established at a distance of less than 1 kilometre on either side of the three points of stoppage, as of course repairs or replenishments during these enforced stoppages are strictly prohibited.

WE have from week to week published the opinions of various drivers in regard to the necessity, or otherwise, of having neutralisations on the Auvergne Circuit, and

last week we exclusively announced that the French Minister of the Interior had determined that there should be protection to the drivers in the form of "halts" during the circuit, in spite of the majority of competitors preferring to have a clear race from end to end. Our information has now been officially confirmed, and it has been definitely settled that there will be three stops on each round, viz., time stops at Laqueuille and Pontgibaud, and a "halt" at Rochefort. The first two are for the purpose of ensuring that no car is within three minutes of the other, so that any car arriving at a less interval to the car in front than three minutes will be detained until three minutes have elapsed. At Roche-



GORDON-BENNETT RACERS.—Another view of one of the De Dietrich Cars. The main clutch has metallic friction surfaces, the petrol tank—behind the seats—has a capacity of 180 metres, and the front and rear wheels are shod, respectively, with 870 by 90 mm., and 920 by 120 mm. tyres



ISLE OF MAN ELIMINATING TRIALS.—Ramsey from the mountain road.

tort each competitor must stop for the purpose of taking an official "stop voucher." Of course, no replenishments of fuel will be allowed at these points during the enforced stoppages.

It is definitely stated that Mr. Thomas has withdrawn

his Locomobile from the American Gordon-Bennett Eliminating Trials.

The 14-mile speed limit in the Isle of Man, under the new Act of the House of Keys, which we recently announced, does not come into force until July 5th.



MILITARY AUTOMOBILE TRANSPORT.

THE Mechanical Transport Company, Army Service Corps, has been in existence two years, and on Friday, 19th inst., the Secretary of State for War (Mr. H. O. Arnold-Forster, M.P.) and Maj.-Gen. H. C. O. Plummer, Quartermaster-General, inspected the corps at Aldershot.

Ten types of machine were on parade, of these seven were steam vehicles and the others were propelled by internal-combustion engines. Among the steam-driven luries, Fowler's "Lion" type is the heaviest, and can carry a useful load of 24 tons a distance of 12 to 15 miles without refilling. Lighter types were the "Usula" which will take 16 tons, and the "Doll" which draws 12 tons, but with all the above luries considerable difficulty has been met with in districts which have a loose sub-soil with a firm surface, they are not safe on light military bridges and are difficult to tranship, so that the Transport Committee are of the opinion that the six-ton engine (Little Giant type) is more suitable for general

work, even although less economical than the larger types. Internal combustion engines were represented by Stirling and Milnes-Daimler. There were four of the latter type on parade, two 4-ton vehicles working entirely on petrol, one 35-cwt. lurry using petrol or paraffin, and another of the same capacity using petrol or alcohol. The paraffin engine is stated to give great satisfaction.

The Field Company Repair Train paraded with the Service Company. The four cars carry between them a lathe, milling machine, drilling and grinding machines, foundry, forge, and fitter's bench. The capabilities of automobilism for military transport are evidently being adequately appreciated at Aldershot, and last year a saving to the country of as much as £7,000 was effected. The possibilities are enormous, but its success obviously depends on the nicety with which the capabilities of the machines meet the practical requirements of military work, which requirements are not by any means those of goods transport in civil life.



Stewards of the Automobile Club.—The following gentlemen were appointed stewards at the recent meeting of the Council held specially for that purpose:—

Duke of Sutherland, K.G.	Sir David Salomons, Bart.
Earl of Dudley.	Sir J. H. A. Macdonald, K.C.B.
Earl of Onslow.	Col. H. C. L. Holden, R.A., F.R.S.
Earl Russell.	Lieut.-Col. Mark Mayhew.
Lord Stanley, M.P.	Mr. W. G. D. Goff.
Hon. Arthur Stanley, M.P.	Mr. Charles Hardy.

IN honour of King Alfonso of Spain, it has been determined by the French authorities to hold a motor speed meeting in the Bois de Boulogne, Paris, on June 3rd. The programme will comprise a speed race over a kilometre open to all racing cars, to be followed by a battle of flowers. The racing will commence at 5 p.m., and the point selected in the Bois is the Sevres Road, which runs from the Boulogne Gate to the Cascade.

WING-FLIGHT—SOME RESEARCHES AT CAMBRIDGE.

MESSRS. E. P. FROST, F. W. H. HUTCHINSON and C. R. D'ESTERRE, have been experimenting with flapping flight, and on Wednesday last Dr. Hutchinson read a paper on this subject, and showed No. 1 model in action, before the Cambridge University Engineering Society. Their ob-

wings, their total area being about 3 sq. ft. The wings were connected with a small electric motor, and a reduction gear arranged to flap them up and down, the whole arrangement being suspended by a spring balance from a balanced lever adapted to move round in a large circle. What is the most interesting feature of the machine is that this up-and-down flapping of the goose's wings occasioned not merely a vibratory up-and-down motion in which the "bird," formed by the two wings, rose and fell, but also produced a forward movement as well, causing the balanced lever to rotate about its centre. In the first experiment, up-and-down oscillation was very noticeable, but after the tail (shown in the illustration) was fitted, the up-and-down oscillations were largely diminished, and practically steady flight accomplished. The best results were obtained when the estimated power applied to the wings was $\frac{1}{10}$ -h.p., and

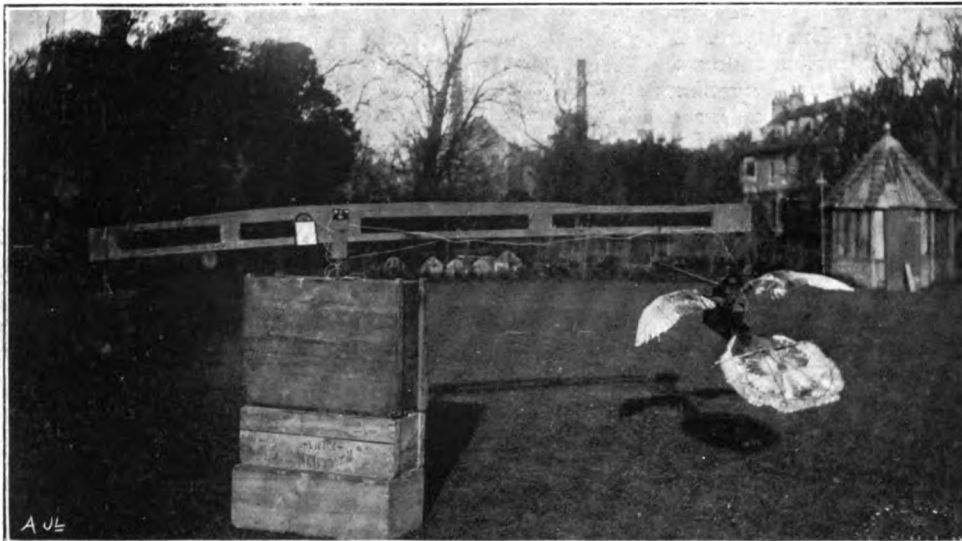


Fig. 1.—Goose's Wings and Tail arranged to be actuated by an Electric Motor, and to demonstrate the fact that up and down flapping flight produces forward motion at the same time, as proved by rotation of the balanced Lever-Arm from which the Mechanism is suspended, round its centre.

ject was to ascertain what practical results could be obtained from this mode of aerial propulsion. The first experiments of the series were carried out in 1887 by Mr. Frost, who used a pair of artificial wings connected to another pair superimposed, both pairs being designed to be flapped synchronously. An aerocurve and aeroplane was fitted in front, and there was an extension behind. The front aerocurve was formed by two wings joined continuously at their inner ends, and the curvature of the wings followed that of the wings of a swift. The motive power consisted of a steam engine, and this, not unnaturally, proved inadequate for the work, so that these experiments gave no practical confirmation of Mr. Frost's theory that a bird flies mainly by flapping its wings at right angles to its line of flight.

The more recent series of experiments was made by Messrs. Frost, Hutchinson, and D'Esterre, with a pair of wings as shown in Fig. 1. These were dried natural (goose)

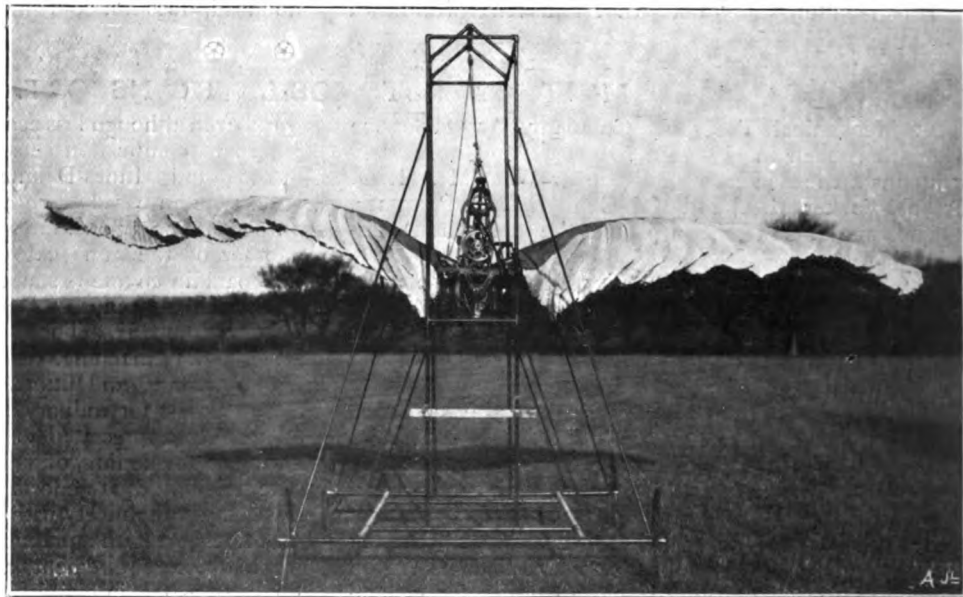


Fig. 2.—Rear view of Artificial Feathered Wings, 20 feet from tip to tip, arranged to be flapped up and down by a 3-h.p. Petrol Motor, to demonstrate both the Lift and Forward Movement obtainable.

the number of flaps per minute was from 350 to 400. The maximum lift under these conditions was measured and found to be 5 lbs., so that the ratio of horse-power to lift under the circumstances was 1-h.p. to 50 lbs. The apparatus weighed about 27 lbs. and its speed was

equivalent to about 4 or 5 miles per hour.

After making these experiments with the goose's wings and tail worked by an electric motor, the experimenters proceeded to construct a large pair of wings covered with feathers, resembling as far as possible the actual pair of wings employed by a bird. These are shown in Figs. 2, 3, and 4, and the wings are designed for up-and-down flapping flight. They are mounted on a vertical car, which is adjusted to show both the lift and the forward movement, and is designed to run on a track of special construction. The total stretch of the wings is about 20 ft., and they are constructed with artificial feathers arranged so as to resemble the actual feathers in a bird's wing. The total area of the wings is as near as possible twenty times that of the first model referred to above, *i.e.*, about 60 sq. ft., and the wings are flapped up and down by a nominal 3-3½ h.p. petrol motor. The transmission is by cone-friction-clutch and chain to connecting-rods working the wings. Elastic bands—"pectoral cords"—are attached to the brackets, which will be noticed below the wings, their object being to store up energy on the up stroke and so tend to steady the load on the engine. The crank-throw and position of crank-shaft are adjustable for altering the direction and angle of the flap. The transmission mechanism for the large wings, comprising the friction-clutch, chain, and connecting-rods, is shown in detail in Fig. 5. The results of this flapping flight with the large machine are, according to the experimenters, very promising. The machine, which is susceptible of considerable lightening, weighs

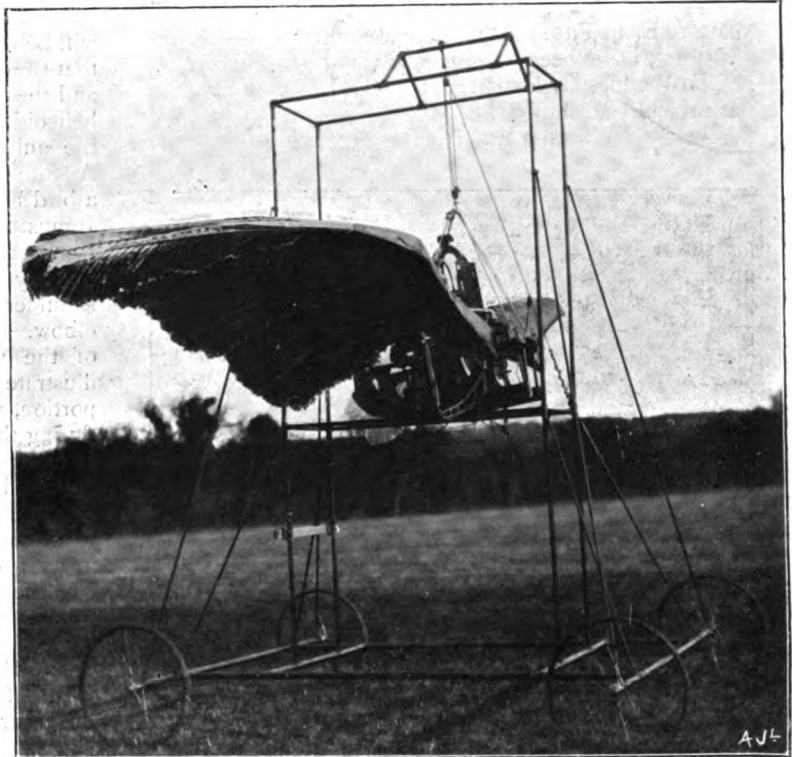


Fig. 3.—The same Mechanism seen from the Side, giving a clearer view of the structure of one of the Feathered Wings.

232 lbs., and, on the downward stroke of the wings, is lifted bodily up in the air and pushed forward. It rises about 2 ft. at each stroke and looks like a gigantic bird trying to fly under similar conditions. At the down strokes, the suspending rope leaves the vertical position and becomes markedly inclined forward, thus indicating, on a large scale, the principle which the inventors have established on a small one, namely, that up-and-down flapping flight with suitably-shaped wings produces, or tends to produce, forward movement. Under these circumstances, it appears that the wings are capable (at 100 flaps per min.) of evoking about 100 lbs. lift each, and of raising the whole machine (weighing 232 lbs.) about 2 ft. at each stroke. The experimenters believe that the employment of feathers, particularly what are called the primary feathers of a wing, are distinctly beneficial, as the feathers work on the air like a series of stepped aeroplanes, each one acting on the air from a different level, and on air which has not had a downward velocity imparted to it by having had to sustain the weight of a previously-acting lifting surface. They state that it is difficult at present to form a correct idea of the position of centre of pressure,

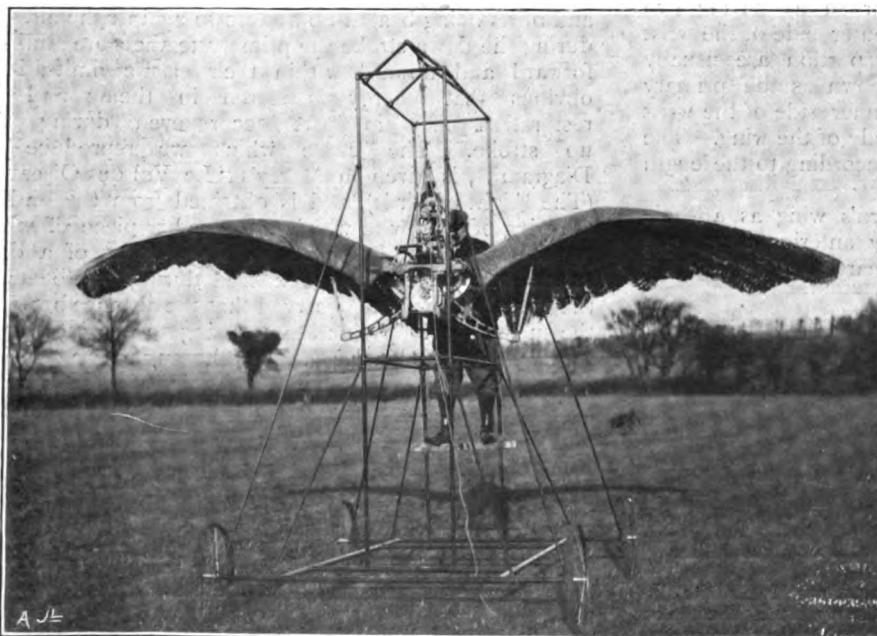


Fig. 4.—The Artificial Feathered Wings viewed from the Front, with Experimenter testing the Lifting power.

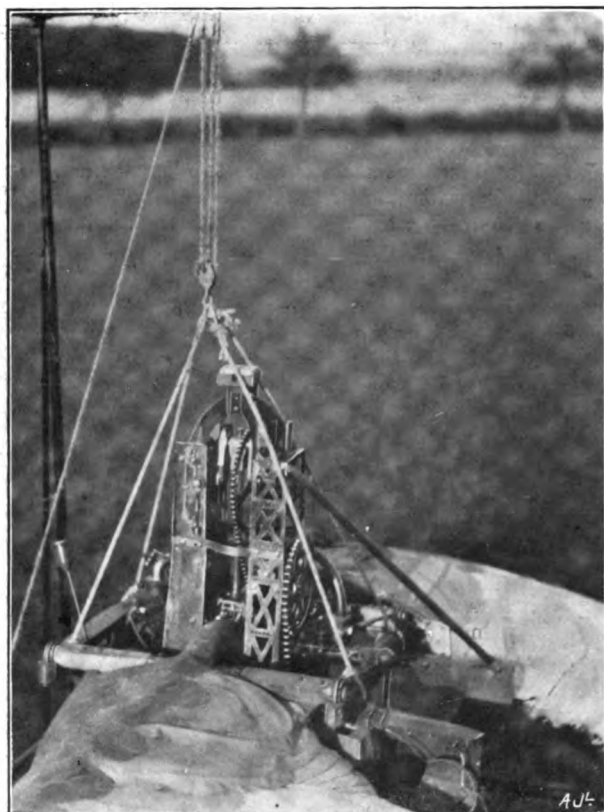
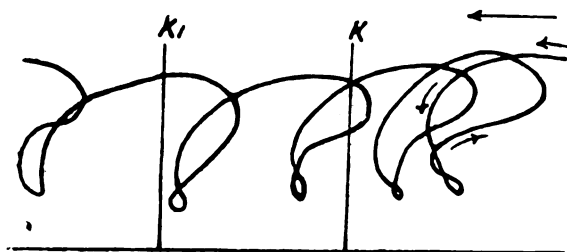


Fig. 5.—Top view of the mechanism showing the manner in which the transmission from the Petrol Motor to the wings is effected, viz., by Clutch and Chain.

but think that it goes through an arc of about 2.25 feet on the downward stroke.

Thanks to Messrs. Hutchinson and Frost, we are able to reproduce some interesting data about bird flight. The wing of a bird may be regarded as having two portions. (1.) That part to the outer side of the wrist joint. The main feathers of this portion are usually about ten in number, and are known as the primary feathers. (2.) That part to the inner side of the wrist joint which may be called the body of the wing. The main feathers of this portion vary according to the length of wing.

A salient characteristic of a bird's wing as a whole is the comparatively rigid and heavy anterior edge, and the light yielding elastic posterior margin.



This tracing was obtained by causing a small bird to fly through a tube internally coated with lamp black, the tip of the wings tracing the curve as shown. In the upper curve, the vertical lines, K and K', show points just before the commencement of one down stroke, and just at the commencement of the next, respectively.

If the primary feathers be examined carefully it will be seen that each one differs from its fellows, and that they differ in a graduated series. The quill is curved, and the feathered portion or penna is set round this in a helicoidal curve. Here again the portion anterior to the quill is stiff compared to the portion behind it. A fore and aft vertical section through the body of a bird's wing discloses a curve of the following shape—

It must be understood that this shape is most nearly approximated to about midway between the wrist and the shoulder joints, that is to say, in the region of the elbow. According to the experimenters the front edge of the wing, that is the front portion of the curve illustrated above, is much more rigid than the back portion, which is elastic, and as this tends to bend up during the downward flap of the wing, the forward drive is explained thereby. It is also obvious that on a wing being elevated a forward and downward resistance is evoked. But the wing is so shaped that the down stroke must encounter greater air resistance than the up stroke, apart from considerations of the amount of energy put into the up and into the down stroke. Also the arrangement of the wing-feathers causes a valvular action. Air passes through the body of the wing on the up stroke.

Mr. Frost has contended that the result of the arrangement of the primaries must be, that on being struck downward in the air, their ends travel forwards and backwards. In flight, the wing-tips of a bird (e.g., a rook) can be seen to be curved upwards. If a shed primary feather be taken and held in its natural orientation and struck smartly down in the air, the tip can be seen to spring markedly forward. Then the posterior edge of the penna becomes tense. But when the feather is not so stressed, the posterior edge is sinuous and has a fulness. Other normal movements have been described, notably the so-called "figure of eight" curve generated by the movements of the wing-tips; but Mr. Frost has contended that all these, and particularly the "figure of eight" curve, are the automatic results of the peculiar construction of the wing, and of its being beaten up and down against the air. If during the down stroke the primary feathers are strained forward and upward within their elastic limits, it is obvious that energy is stored in them; and its restoration may in part occur even during the up stroke. The curve which we reproduce in Diagram A, is given in Marey's "*Le Vol des Oiseaux*" (The Flight of Birds), and is obtained from the end of the wing of a crow to which was fixed a piece of white paper, and the crow caused to fly in front of a dark screen, the camera being exposed during five beats of the wings. It will be observed that the distance between the successive loops increases, owing to the increasing velocity of the bird in flying. The other curve (Diagram B), also represents the movement of the tips of a bird's wing, and was obtained by Major Baden-Powell in an interesting way. Some small birds were procured, and



Curves showing the movement of the tips of the wings of birds in flight. The curve was obtained by photographing a fragment of white paper attached to the tip of a rook's wing.

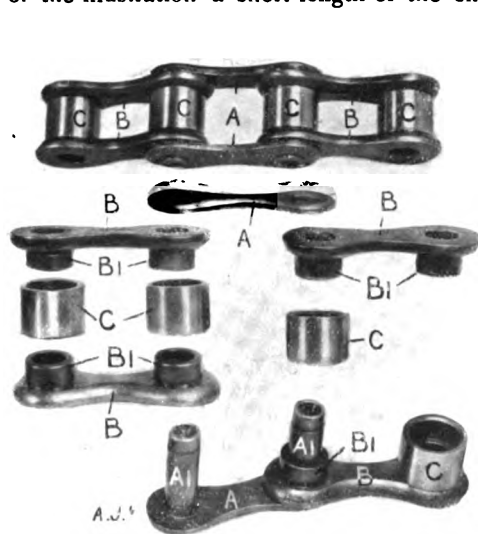
tubes of paper obtained, the internal diameter of which were approximately equal to the distance between the tips of the outstretched wings of the birds. The internal surfaces of the tubes were covered with a coating of lamp-black. The tube was arranged with one end in a room and the other end pointing out of doors, through an open window, the bird being liberated at the inner end of the tube. As the bird flew out towards the light, records of the movements of its wings were obtained on the lamp-black, and the curves thus traced are reproduced herewith. The dotted strokes are believed to represent the upstroke of the wings and are very faint, owing to the flexure of the wing in that position, the down strokes (owing to the fact that they extend the wing) being more pronounced.

The experiments are on the whole extremely interesting, but it must not be left out of account that they are still in a very rudimentary stage. In fact they cannot be said to have progressed further or even as far as Sir Hiram Maxim with his aeroplane. The lift for horse-

power obtained, *i.e.*, 50 lbs., is less than the Wrights are said to have obtained with their motor-driven aeroplane, and certainly less than pre-eminent authorities regard as possible in the case of adequately propelled machines of the Wright or Chanute type. The chief point of interest is that mere up-and-down flappings of wings of the bird type produces forward movement. The main question, however, in regard to the problem is the control of the machine. If it is proved satisfactorily that a machine with up-and-down flapping wings, even though it gives somewhat less lift and forward movement than an aeroplane with propeller, is easier to control, then we shall have a distinct contribution to the problem of flight, but failing this, we do not really know quite where we are, for the question of lift is not considered to be the most important matter in connection with the problem. It is quite possible to produce adequate lift by the mechanical means at present at our disposal. It is the successful controlling of the machine which is necessary to enable effective flight to be accomplished.

THE COVENTRY CHAIN.

So much depends on the satisfactory behaviour of the chain on those motor cars which are of the chain-driven type, and to such a state of perfection have chains now been brought by the careful design and workmanship of their manufacturers, that our photograph, showing the elemental parts in a Coventry chain, cannot fail to be of interest to our readers, inasmuch as it indicates the method of construction adopted by one of the leading British makers. In the upper part of the illustration a short length of the chain is shown



complete, while the elements, of which the chain is composed, are arranged below in their respective positions relatively to one another.

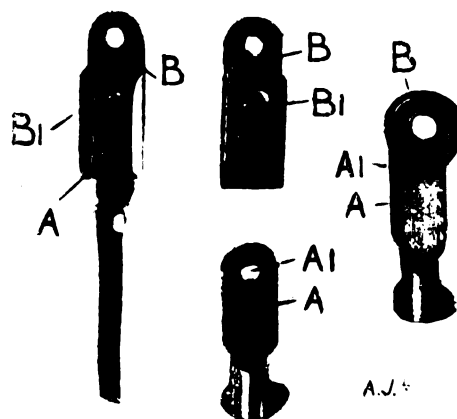
Each alternate link is formed by two flat side plates, A, to which are riveted the cross-pins, A¹,

and the intermediate links are also formed by two side plates, B, but these are solid, with hollow bosses, B¹, which ride on the pins, A¹. The "rollers," C, are quite free when in place over the bosses, B¹, and they cannot become jammed between the side plates, B, because the bosses, B¹, are sufficiently long to butt up against one another.

The feature of this roller chain is, of course, the formation of the plate, B, in one solid piece, with the bosses, B, instead of employing additional loose sleeves in the usual way. This construction, although admittedly more expensive, is considered desirable by the Coventry Chain Company, who lay stress on the claim that their chains have in this way one-third fewer pieces than any other roller chain of equal dimensions.

AN AUTOMATIC COUPLER.

DETACHABLE connectors for fastening wires to sparking plugs and batteries are a great convenience, for not only do they facilitate the attachment of wires to terminals, but they also reduce the chance of the bare end of the wire itself breaking off through repeated



bending. The "Automatic" Company have now placed on the English market the two connectors shown in the accompanying illustration. The action of both these devices is almost self-explanatory; in that shown on the left, the wire is attached to the member, A, which slides into contact with the member, B, attached to the terminal. The two pieces—shown separated in the centre of the illustration—are prevented from shaking apart by the spring-clip, B¹, which engages in the hole, A¹.

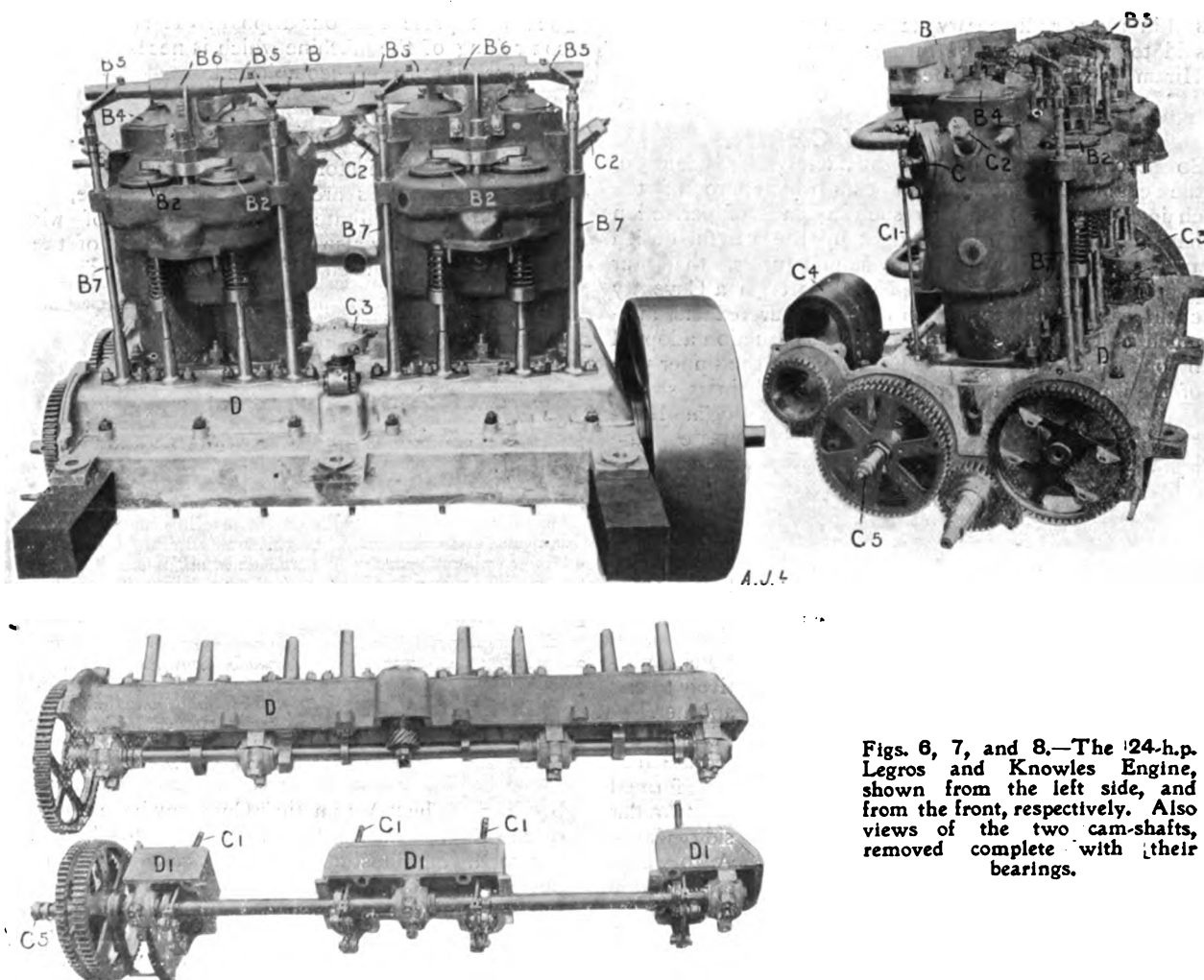
The device shown on the right of the illustration is similar in principle but somewhat different in construction. The ring, B, is formed of two stamped discs, and the plate, A, has a beaded edge, A¹, which engages with corresponding beads in the periphery of the ring, B. In the illustration these two members are only shown partly in engagement. Compared with the other device, this fastening does not appear to be so satisfactory, neither as to the extent of the surfaces in contact nor as to the security of the connection.

THE LEGROS AND KNOWLES PETROL TOURING CAR.—PART III.

The Engine.

THE cylinder-castings, each of which forms a pair of cylinders—complete with their heads and water-jacket—are of somewhat unusual shape. Centrally above each cylinder, the casting receives the inlet-valves—complete with their seatings, guides and springs—and between the two valves is a single stud that enables both valves to be held securely down in place by a yoke and one nut. Communicating with both valves, is a port in the casting itself, and thus the induction-pipe-fitting, B, is quite in-

were to break or the valve were to come loose. The construction of the valves themselves is best seen in Fig. 11, where it will be noticed that the valve-spindle has one long guide formed for it in the seat-casting, B³, and another shorter guide in the upper cover, B⁴. The spring that normally holds the valve up against its seat is contained inside the two small castings, B³ and B⁴, and the explosive mixture finds its way to the valve through the holes that are drilled in the former; it will, of course, be understood that the valve-spindle projects through



Figs. 6, 7, and 8.—The 24-h.p. Legros and Knowles Engine, shown from the left side, and from the front, respectively. Also views of the two cam-shafts, removed complete with their bearings.

dependently bolted in place to the cylinder-castings. The induction-pipe, B¹, is led up from the carburettor to the centre of the fitting, B, and it will be understood that these parts lie on the right side of the engine. On the left side, the valve-chambers for the exhaust-valves are arranged in the usual way, and there are inspection covers, B², above each valve, each pair of covers being held down in precisely the same way as the inlet-valves.

The cylinder-castings are so shaped beneath the inlet-valves that it is impossible for either of these valves to fall through into the cylinder, even if the valve-spindle

the top of the cover-casting, B⁴. Our illustrations well show how the valves are operated, mechanically, from the same cam-shaft as that which actuates the exhaust-valves. The exhaust-valves have the usual conical faces, but the inlet-valves have flat seats. The pivoted levers, B⁵, which operate the inlet-valves, ride freely upon a shaft which is held in place by the two brackets, B⁶, and the vertical push-rods, B⁷, not only pass through guides of the usual form—above the crank-chamber—but also through upper guides formed in the cylinder castings. The push-rods are rendered adjustable

as to length at their upper ends, for enabling the valves to be "set" properly.

Fitting at an angle, through the cylinder walls on the right, are the low-tension igniters, C, and these are operated by an independent cam-shaft, which—like that for the valves on the other side—is completely enclosed in the crank-chamber. These igniters operate in the usual manner, and are of very simple construction, but they differ somewhat from the most customary practice, inasmuch as the contact points are mechanically separated by the *direct* action of the cams, and springs are only employed for bringing the contacts together again; they are operated by the small rods, C¹, which are pulled *downwards* by the cam.

Our illustrations also show the high-tension ignition-plugs, C², which can be fitted—as a supplementary system—when desired, and are recommended by the makers both because they render starting easy, and because the high-tension system constitutes a standby in case of breakdown. These plugs lie diagonally, and pass through into the cylinder head. The commutator, C³, which is employed in conjunction with them, is mounted on the upper end of a short vertical shaft that projects upward through the top of the crank-chamber, and is driven by skew-gearing from the main cam-shaft.

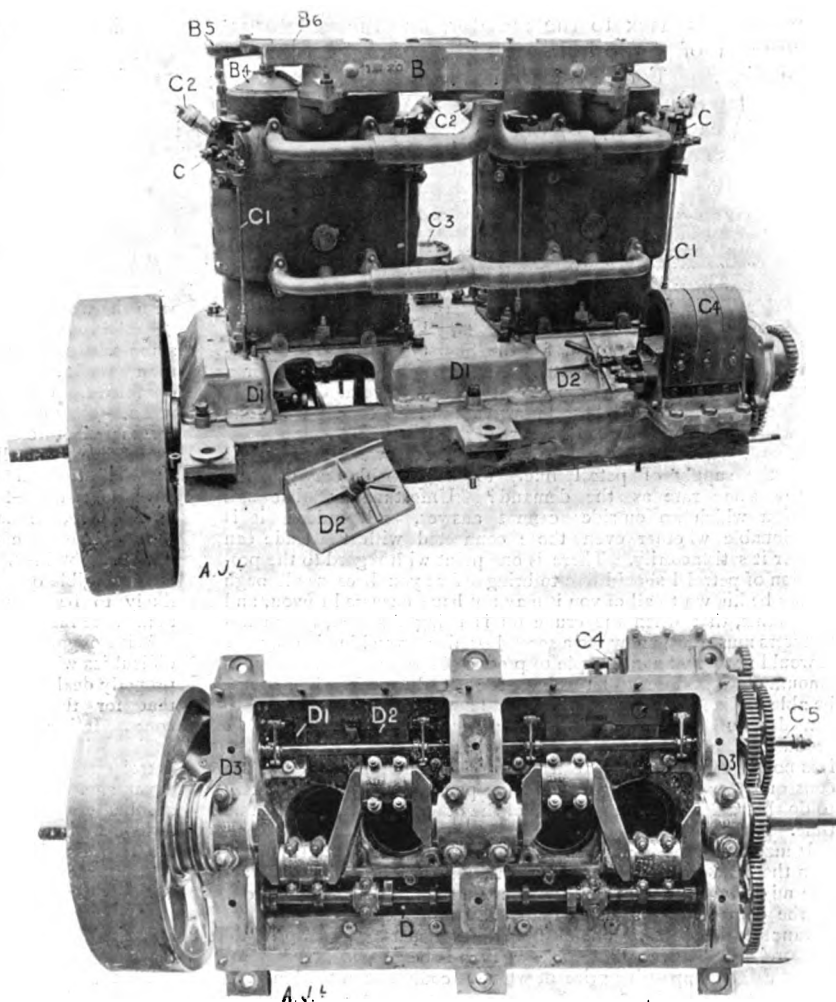
The low-tension magneto, C⁴, that supplies the necessary current for the igniters, C, is fixed to the crank-chamber on the right side, and is driven by gearing from the ignition cam-shaft.

The construction of the crank-chamber is particularly ingenious, for the main aluminium casting—which has six projecting lugs by which the engine is fixed in place—is so constructed that both cam-shafts can be lifted out complete with their bearings, and that the base can be entirely removed without disturbing the crank-shaft. The construction adopted is well shown in Figs. 6 to 10, and in Fig. 8 the cam-shafts (with their bearings) are shown separately. The shaft that operates the inlet and exhaust-valves is carried in four bearings by the casting, D, and the ignition cam-shaft is similarly supported by bearings that are provided by the three independent castings, D¹. The castings, D and D¹, can be slid down into place from above, and they then practically form a part of the crank-chamber itself. The two openings between the castings, D¹, enable the main bearings to be reached by hand at any time, for these openings are normally closed by readily detachable doors, D², which are held in place like the lid of an ordinary "manhole." The base casting is held up by studs, and it fits into the grooves, D³, that are formed round the end bearings—thus making an oil-tight joint.

It will be seen in Figs. 8 and 10 that the ignition-cams, on the smaller cam-shaft, operate the vertical

rods, C³, through small pivoted levers that are mounted on the underside of the shaft, and that they thus pull down the rods, C¹, when the cams come into operation.

The cams are so shaped as to give an extremely quick "break," and they are—like the cams on the other shaft—formed solid with their nickel-steel shafts. The "time of ignition" is varied by rocking the ignition cam-shaft through an angle inside the spur-wheel that drives it, this being done by moving the rod, C⁵, longitudinally. The other spur-wheel is fixed rigidly to the



Figs. 9 and 10.—The 24-h.p. Legros and Knowles Engine, shown from the right side and from beneath, respectively. The base of the crank-chamber has been removed.

cam-shaft, and therefore the magneto which it drives is "timed" in accordance with the "timing" of the igniters.

The nickel-steel crank-shaft is provided with three main bearings, as seen in Fig. 10, and, above each of these bearings is an oil-retaining cavity of large size into which the lubricating oil for the crank-chamber is first led. These cavities are therefore always kept full of oil, and thus the bearings receive an ample supply. The shape of the shaft is well shown in the illustration referred to. In Fig. 12, one of the pistons, and one of the connecting-rods, are shown separately.

The gear-wheels that drive the cam-shafts and the magneto are completely enclosed by a cover that is made in two pieces, and is bolted to the front end of the crank-chamber. It forms an oil-tight casing, and is arranged so that it can be removed without difficulty when necessary. The timing-rod, C⁵, and the crank-shaft project through it.

In Fig. 13, the construction of the centrifugal circulating-pump is well demonstrated. This pump is gear-driven by the engine, and it forces the water into the jackets at the base of each of the four cylinders. A similar branched pipe conducts the water from above the four cylinder-heads back to the radiator, and the radiator is constructed of vertical finned tubes arranged within a tank-casing. For feeding oil to the engine, the mechanical lubricator on the dashboard is driven by enclosed gearing (and by the small shafts, E), from the main cam-shaft, this arrangement overcoming, in a very

neat manner, the employment of a belt or chain. The fan, however, that is fixed behind the radiator, is driven by a belt in the usual manner, and this fan is, to a certain extent, assisted in its action by fan-blades in the flywheel and in the inner clutch-member.

The carburettor is of much the usual spray type, but it has two inter-connected throttle-valves that tend to maintain an approximately constant richness of mixture at various loads. The one throttle-valve is introduced between the mixing-chamber and the induction-pipe, the other between that chamber and the air-supply pipe. The speed and power of the engine are entirely controlled by a single lever fitted above the steering-wheel. It simultaneously acts on the throttle-valves, and on the "timing" gear for the low-tension igniters. The high-tension ignition system is timed by a separate lever, that is fixed to the dashboard.

(To be continued.)

◆ ◆ ◆ INDUSTRIAL ALCOHOL.

ON Friday, the 19th inst., the Society of Motor Manufacturers and Traders gave a dinner at the Hotel Cecil in honour of Dr. Ormandy, who appeared for the Society before the Departmental Committee on Industrial Alcohol. After the dinner a discussion was held on the report of the Departmental Committee, in which several of the best known authorities took part. The following is a brief *resumé* of their remarks.

Dr. W. R. Ormandy said: The question we have to ask is, is the supply of petrol likely to be capable of growing at the same rate as the demand? Unfortunately, that is a question which an outsider cannot answer, and, indeed, it is questionable whether even those connected with the trade can answer it satisfactorily. There is one point with regard to the production of petrol I should like to bring before you, because although it may be known to all of you it may not have occurred to you, and that is this, that when the crude oil is being distilled, the manufacturers must have an eye to a second product as an illuminating oil. It would not pay the oil people to produce or to pump a tremendous amount of oil in order to let us have the petrol from it. They must be able to dispose of the whole lot. They have illuminating oil to consider, and the price of it is regulated by the price of the other products which are necessarily obtained at the same time. So that it is no use to say that they can pump up so much more oil and can consequently produce us so much more petrol. They are not likely to do that unless they can dispose of the other products at the same time.

It must be borne in mind also that the supply of this vital material is in the hands of people foreign to us, and the possibility of warfare might mean the possibility of our supply of fuel being cut off. If the demand grows faster than the supply, we shall have an advance in the prices. The chairman has remarked it is possible and probable that petrol at 6d. per gallon is being sold at what we might call a competitive price, at which it could not in the long run pay to retail it. This being so, we may consider the situation at present is that although there is no immediate likelihood of a dearth of fuel, still it behoves us, if we are wise, to cast an eye on those substances which may possibly be used as a substitute. Now let us turn to these—paraffin, benzole, coal. The list is somewhat short. I do not think there is any other substance which can be produced in sufficient quantities to be even worthy of consideration. The difficulties that have been met with in the utilisation of paraffin in internal combustion engines some of you will know, and the commercial man can judge by the fact that the percentage of internal combustion engines driven by paraffin at the present moment is so small that you can only draw one conclusion from that, namely, that there is some difficulty associated with it. Paraffin is cheaper than petrol, and has been for a long time. It is easily obtainable, yet one must draw the conclusion that the reason why paraffin is not so widely used in internal combustion engines as petrol must be that there is some inherent defect attendant upon the use of paraffin, otherwise its cheapness and the ease with which it can be obtained must have worked in its favour. Further, whatever objections may be urged against the use of petrol because it is held chiefly in foreign hands apply equally to paraffin oil.

Now then, let us turn to the next substitute, that is benzol. I use that word benzol advisedly, because it is frequently mixed up

with the word benzene. The word benzene is used and the word benzol is used, and they should designate two entirely different substances. In America benzene is used with a lower boiling point than paraffin. The word benzol should be applied to hydro-carbons obtained from the distillation of coal tar. Now, until recent years, when modern coke ovens were replacing the old bee-hive ovens for the manufacture of coke for blast furnaces, the amount in use was comparatively small. It was only produced from the gas works, and recovered from the coal tar which was produced. On the Continent and in Germany—to the fore as is now customary in scientific things

they have, we may say, entirely replaced their bee-hive ovens by recuperative coke ovens, and from these a very large amount of benzol is obtained. Nevertheless, the amount of benzol produced is a negligible quantity compared with those quantities which are likely to be required for the automobile industries in the very immediate future.

With regard to alcohol, there was the question whether the difficulties which had been raised before the Commission had been properly dealt with, and certainly they were considered so serious that for the time being, at least, they put alcohol out of court. It is an undoubted fact that a properly-designed alcohol engine will give 30 to 34 per cent. in efficiency. The average petrol engine does not give 20. That in itself is a very great advantage. Then again, the material for the fuel can be made in absolutely unlimited quantities. It is simply limited by the amount of land we like to cultivate, and I should like to point out here that the progress of science at the present moment is in the direction of making alcohol from cellulose, that is to say from woody fibre. There is very little doubt that in the very immediate future the prime source of alcohol will be from wood residues—which is for the majority of purposes of little or no value, or is of such little value that it is allowed to rot upon the ground.

That time has not yet arrived. There are processes used in Germany which claim to be able to produce very large yields of alcohol from wood, but they have not been worked on a commercial scale sufficiently long, and on a sufficiently large scale to enable us to say that these are the processes of to-day. Now there are other advantages of alcohol. If it is burned in a properly designed engine the effluent gases are practically odourless. Now that has been very strongly denied, but I think it will be found that in cases where the exhaust has had an evil smell, the alcohol was being used in an engine originally designed to run on petrol, or it was being used mixed with a very large quantity of benzol. Now this is one of the disadvantages which have been brought forward. To use the exact language of the report of the Departmental Committee on Industrial Alcohol:—"For motor cars, spirit presents special difficulties, which require to be overcome, the principal being the behaviour of alcohol in very cold weather, and the tendency of the acids generated by its combustion to cause corrosion of the metal surfaces with which they come in contact." It is particularly with regard to the latter phrase that I wish to speak. When giving evidence before this same Commission that very point was raised, but was raised very briefly.

I think the only point where the question of corrosion occurs is where the statement was made in my evidence: "Motors are working with this substance with every degree of success; there is no

question of their absolute success." That was the statement which I made after having been to Germany particularly with the view of investigating these and other points closely connected with the behaviour of alcohol in very cold weather, and the tendency to cause corrosion of the metal surfaces with which they come in contact. My chief source of information was Chief-Engineer Fairman, who was deputed by the Centrale in Berlin to make investigations, and those investigations lasted over three years. At the end of that time he reported that in no case were there any traces of that corrosion, which was the point which the Germans themselves feared, except one, and in that one case it was an engine which was running very occasionally. It was an experimental engine, and the corrosion that was found was in the exhaust-box. So I do not consider that that was very strong evidence as to corrosion taking place; but I wish to record this, that the engines which he reported upon were particularly designed to run on alcohol as a fuel, and were able to work at a high compression, and were provided with a special carburettor particularly adapted for this fuel. Then to read the statement in the report is somewhat curious: "And the tendency of the acids generated by its combustion to cause corrosion of the metal surfaces with which they come in contact." It is an undoubted fact that the German Government, in their anxiety to push the use of alcohol as far as possible, did bring weight to bear upon the motor cab drivers and so on in Berlin. These had motors designed to run with petrol, and were not, therefore, altogether satisfactory.

A little further on in the Report there is another point which I wish to bring before your notice. Dr. Thorpe states, "We were informed also that although theoretically much better results might, from a mechanical point of view, come from the use of high compression, as you have explained, nevertheless it appeared that the increase in the formation of these acid products was so considerable that an effective stop was soon brought to this economical effect." I do not think that the fact that this statement is made by a Government expert, and appears in this evidence, will be of sufficient weight to convince this Society that the corrosion is anything but the result of imperfect combustion. And that is what the statement is equivalent to. I think it is generally recognised that the greater the compression under which you fire a mixture, the greater the probability is that that mixture will be adequately and completely burned. If any strong corrosion is given out from alcohol it is due to one thing. It is that the carburettor is not giving enough air, and you are not getting enough oxygen to burn the alcohol which is there. I think we may take it that this is not one of the evils or objections which is to be laid at the door of this fuel. But the second point, which is there referred to, is the question of the difficulty in starting, and I think that must be considered; but I think if one tithe of the work which has been spent on the petrol carburettor had been spent on the alcohol carburettor, there would not be the same necessity to urge this difficulty upon us.

Then there is, of course, the question of building an engine to work on a high compression. As this is a compression of 10 atmospheres or so, it is really a high compression, but still I do not think that objection will be one which will prevent us from going forward. There is one question and that is a very important one, and it is the question of cost. In the evidence which was given before the Commission by one of the big distillers, the statement is made that a gallon of proof alcohol could be produced at 6d. if the distillers were allowed to work with the most modern plant and with the least amount of obstruction, practically no obstruction at all. It is a distiller who makes that statement. Now I should like to call your attention to the Appendix in the Report of the Commission. One of the distillers stated that if bounty-fed alcohol were allowed to come in from Germany, they could not possibly hope to compete with it, because the distiller worked under certain restrictions which keeps the price up very much here in this country. The Government recognised there was truth in this and asked them to forward a statement showing what surtax would have to be placed on this bounty-fed alcohol, which was being imported from abroad, in order to equalise matters. The Scotch distillers claimed that the sum of 9d. would be necessary, and the English distillers claimed 9½d. The Government, however, allowed 5d., and one is led to the conclusion that although they only got 5d., they managed to make both ends meet. However, the point is this, that alcohol can be made at a strength suitable for the purposes of automobilism at about 10d. per gallon in this country.

The Commissioners have recognised that many industries in this country have been hampered by having to pay too large a price for alcohol, and they have decided that it is only fair to knock off the sum of 3d. per proof gallon to compensate them—that is to reduce the price by the sum of 3d. in order to work more on terms like those of their foreign competitors. Is this 3d. per proof gallon, or 5d. approximately per bulk gallon, for strong alcohol such as we require if we use that

alcohol? If so, the price of alcohol is going to be reduced from what it is at present by the sum of 5d., which would make it at the present moment 1s. 5d. a gallon. I think it is quite obvious that at 1s. 5d. per gallon alcohol does not stand a chance. It is not a price which is going to tempt motor manufacturers to build engines. The question for us to consider is this. Are the advantages to be gained of a sufficient degree to permit of us calling upon the Government to make some further sacrifice in order that we should get alcohol at a lower price? Is it necessary that we should call upon them to make some reduction in order that we should be able to get alcohol at less than 1s. 5d. per gallon? It has been urged in some directions that alcohol can be made from potatoes, and that we may encourage agriculture, and that we may encourage Ireland. It is quite true that abroad alcohol is made from potatoes, but the Government certainly helps in the matter, and the one point in the report dealing with Germany which appears of importance to me is this: "We do not think that the users of industrial alcohol in Germany are really strongly benefited by German legislation." Then why do the Government behave as they do? Because they think that the total gain to the nation by the encouragement of agriculture, by the policy of having a population upon land which would otherwise be incapable of holding a population, the employment of men in the winter in the distilleries who would otherwise be idle, the increased money obtained in taxation, the increased benefits indirectly derived from increased trades, are such that it pays the Government indirectly in the end to spend money directly in reducing the price of alcohol. And it is a question of how far it would do to adopt this point of view in this country. We cannot make alcohol from potatoes in this country at a price which would enable it to compete with petrol. With potatoes at £1 a ton we can make alcohol at about 1s. a gallon. But are there no other arguments in favour of cultivating potatoes on a large scale which the nation would reap the benefits of? A very small proportion of that money spent in aiding agriculture and in the growing of potatoes would also lead to the formation of a food reserve for time of war, and at the same time these potatoes could be used, when their necessity as food was not there, to produce alcohol. There is another possibility, we can get alcohol from our colonies at an exceedingly low price. In conclusion, it seems to me it ought to be worth the while of this Society to form a committee to enquire into the possibilities of this fuel; to settle definitely whether alcohol can be used—I mean from a mechanical standpoint; are the objections raised by the Commissioners valid or are they not? Can an engine be designed which will work with this fuel if we build it?

The chairman (Mr. Straker) said: "I do not want to make any undesirable remarks bearing upon the use of alcohol, as I believe there is a very great future for it, but that is one of the existing difficulties which will have to be met by the automobile engineer. He will have to start an engine with 120 lbs. compression. We know in practice that about 60 to 70 lbs. of compression is all we care to have on a petrol engine unless we have got some relief valve to enable the engine to start without difficulty. And I should like very much to know in what way we can facilitate this starting, because that is a point which will have to be dealt with and overcome. In Germany there is a duty upon petrol, which of course materially stimulates the use of alcohol as a spirit for the use of internal combustion engines. So far, alcohol is produced in Germany at a lower cost than you can produce petrol, because the duty on petrol makes it more costly, and no doubt methyl spirit, which is a non-potable, is used very largely for this purpose. In fact, I do not think I am exaggerating when I say that three or four thousand stationary engines—not motor car engines—are working day in and day out just as our gas engines are. Again, I should like to point out to you another matter connected with the industry, or rather the commercial section of automobilism, and that is that the present difficulties in connection with insurance are a very great obstruction to progress. None of the London docks, nor in fact any docks, will permit the employment of petrol-driven vehicles where this highly volatile spirit is used for combustion purposes in their precincts, and therefore if we could employ alcohol—it is a spirit which gives off no vapour practically at normal temperatures—it would largely get over the insurance difficulty.

(To be concluded.)



WE are glad to be able to chronicle a notable success to the North Shields motor lifeboat. An oil tank steamer coming up the Tyne collided with a London collier. The crew of the oil vessel took to the boats, all of which were immediately taken in tow by the motor lifeboat which had come to the assistance of the disabled vessel.

THE MOTOR UNION MEET AT NOTTINGHAM AND WELBECK.



The Hon. A. Stanley, M.P., the Chairman of the A.C.G.B.I. and Motor Union, who helped so much to the success of the Inter-Club gathering at Nottingham and Welbeck.

IN conformity with the resolution recently adopted by the Motor Union, of holding a certain number of official meetings in provincial towns and centres, a field day was organised to take place at Nottingham and Welbeck Abbey, and a meet of cars at the Duke of Portland's celebrated country seat was held on the afternoon of Saturday last, followed by a dinner at the Victoria Station Hotel, at Nottingham, in the evening — the celebrations being arranged in conjunction with the Nottinghamshire Automobile Club, who to some extent acted as hosts on the occasion. Though the social events connected with the meeting took place on Saturday, the greater number of those attending the celebration found their way to Nottingham on the previous afternoon, and a considerable amount of business, consisting mainly of committee meetings, was transacted on the evening of that day.

Mr. S. F. Edge had been good enough to place a seat on his 6-cylinder Napier car at our disposal, and under his pilotage we commenced the

journey northward on the Friday evening, arriving at our destination, needless to say, without hitch or untoward incident of any kind. The official programme opened on Saturday morning by the reception of the Motor Union delegates and committee of the Nottinghamshire Automobile Club in the Exchange Hall by the civic authorities, headed by the Mayor. The chief magistrate of the city welcomed the visitors in a speech full of the most hearty goodwill to the automobile movement. Congratulations were offered to the Town Clerk on the small number of motorists who were ever called upon to appear before the local bench, a fact he attributed (in his reply) both to the desire of the authorities to avoid hampering the movement, and to the good sense of the automobilists of the district. The wine cup, that indispensable adjunct of all civic proceedings, was then set in motion, and subsequently the members of the Motor Union and the

Nottinghamshire Club lunched together at the Victoria Station Hotel.

At 1.45 the street was alive with motor cars getting under way for Welbeck. The police, who were present in large numbers, assisting in marshalling the cars, regulating the traffic, and taking the greatest pains at all possible cross roads and streets to ensure that none of the visitors missed their way.

The Duke and Duchess of Portland "At Home."

Altogether 150 different motor cars assembled in the justly celebrated grounds of Welbeck Abbey, where the Motor Union and the Nottinghamshire Club were welcomed by the Duke and Duchess of Portland. The Duke himself took very special interest in all the arrivals, and he and his secretary, Captain Amory, were both present to welcome the vehicles at the Low Wood Yard, and it was noted that both the Duke himself and his secretary devoted a very critical examination to the cars as they filed past, appraising the leading features of the various vehicles with the ready comprehension of experts. This in itself is a testimonial to the importance the movement has acquired. The Duke of Portland is perhaps the leading sportsman in the country. He is one of its greatest, if not its greatest, horse fancier, and his conversion to automobilism and his hearty interest in all its doings, is on that account all the more noteworthy and significant. The scene was one that is not likely to be forgotten by any who were present. The glorious Welbeck Woods were in the first green of summer, and the winding road through the park provided an apparently unending cortège of automobiles of all kinds and varieties and sizes, following one another in a more or less irregular procession. Most elaborate and considerate arrangements had been made at the Abbey for showing the visitors all the numerous points of interest, and excellent provision for garaging the cars of those who required it had also been provided. Interest naturally concentrated in the celebrated underground buildings constructed by the late eccentric Duke, and probably many of the visitors found the time allotted for their inspection far too short, when at a quarter past four the Duke and Duchess of Portland headed the procession of cars through the gardens and park to Edwinstowe, where they entertained the assembled automobilists at afternoon tea.

In spite of the keenness of the air, suggestive rather of autumn than the end of spring, the weather was bright and fine. It was just the moment of the year when Welbeck is perhaps at its best, and probably few other parks could have provided so exquisite a spectacle as the immense, almost unlimited, expanse of wild hyacinths shimmering under the stately park trees and fading in the distance into a haze of purple mist—

"a paradise

Of blossom, over sheets of hyacinth,
That seemed the heavens upbreking through the earth."

Enjoyment of the beauties of the scene and of the whole excursion.



MOTOR UNION INTER-CLUB MEET.—At Welbeck. Cars "stacked" at the Low Wood Yard. The "head" and the "tail" of the stack.



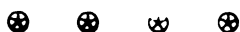
Mr. S. F. Edge and his 6-Cylinder Napier at the Motor Union Inter-Club Meet at Welbeck. Dr. Dawson Turner, the Scottish Club delegate, is seated in the car.

sion, including the run from London to Nottingham and back, were enhanced by the really delightful running of the 6-cylinder Napier car on which we made the journey. Acquainted though we had previously been with its good qualities, it required a long run like this to adequately bring home not only its wonderful noiselessness,

elasticity and controllability, but the perfect ease with which both the most trying conditions of traffic could be negotiated at walking pace, and the stiffest hills surmounted at high speed without ever changing from the top-gear.

The dinner in the evening at the Victoria Station Hotel was a most successful function, the principal speeches being delivered by Mr. Atkey, on behalf of the Nottinghamshire Club, who was humorous and epigrammatic, and put everyone in good humour.

He was followed by the chairman, the Hon. Arthur Stanley, who stated that the Duke of Portland particularly wished his regret at the fact that it was impossible for him to attend, to be publicly announced. The chairman, in a well considered and far-seeing speech, drew the attention of all motorists to the burning question of the hour, the mischief being done to the prospects of the industry by irresponsible and inconsiderate drivers, and the importance of eliminating that pest—a much worse pest to the majority of motorists than to anybody else—"the road hog." That was one of the chief duties of the members of the Motor Union, and the forty other bodies affiliated with it, numbering in all upwards of 8 000. The opponents of automobilism were in the habit of pretending that motoring was a luxury and a sport of the rich. It had got far beyond that. It had become necessary to the life of the nation—part of the plant, in fact, without which the country could not carry on its business. It was to be hoped that the present feeling would not result in prohibitive legislation when the Motor Car Bill came up next year, and that neither branch of the Legislature would venture to put back the hands of the clock, for other countries were not standing still, but straining every nerve in the race towards automobile supremacy.



RACES, RECORDS, AND TRIALS.

SIDDELEY-MEYAN CHALLENGE.

ITINERARY.

THE gauntlet thrown down by M. Meyan recently, impeaching the reliability of British-built cars when run side by side with French cars, was, as we have already recorded in these pages, quickly snapped up by Mr. Siddeley. Since its acceptance considerable correspondence has been going on between Mr. Siddeley and M. Meyan in order to arrive at a proper understanding for carrying out the match. Reading between the lines of the communications, it would appear as if the challenge was originally issued by M. Meyan somewhat too hastily, but Mr. Siddeley, as a true sportsman, has not allowed any terms or conditions to turn him from going through with the test, he accepting such conditions as in England would be voted unsatisfactory, if not prohibitory. The action of the French A.C. also, in refusing to appoint an observer officially, is in strong contrast to that of the British Club, who have consented to be represented by an observer in the interests of British manufacturers. Although M. Meyan could not see his way to driving half of the distance of 5,000 kilometres in England, the exquisite route selected by him in France in a large measure must compensate for any regrets which Mr. Siddeley may otherwise feel in having to give in upon this point. The month selected, viz., the second fortnight in July, lends added interest to this side of the contest. The daily runs chosen are annexed.

Coming to the arrangements for the detailed conditions under which the match shall be decided, M. Meyan submitted that repairs should be allowed to the cars and help allowed to be given by the passengers and by

1. Paris, Rozoy, Sezanne, Vitry-le-François, St. Dizier, Ligny-en-Barrois, Void, Toul, Nancy...	Kils. 309
2. Nancy, Epinal, Remiremont, De Thillot, St. Maurice, Ballon d'Alsace, Belfort, Arcey, Besançon, Salins...	311
3. Salins, Mouchard, Lous de Saunier, Bourg, Morestel, Voiron, Grenoble, Le Bourg d'Oisans, Le Lautaret...	338
4. Le Lautaret, Briançon, Embrun, Obaye, Barcelonnette, col d'Allos, Puget-Théniers, Nice...	290
5. Nice, Frejus, Brignoles, St. Zacharie, Marseille, Salon, Arles, Nîmes...	312
6. Nîmes, Le Vigah, St. Affrique, Albi, Gaillac, Toulouse...	325
7. Toulouse, St. Gandens, Luchon, col de Peyresourde, Arreau, col d'Aspin, St. Marie de Campan, col du Tourmalet, Luz, Lourdes, Pau...	302
8. Pau, Orthez, Bayonne, Labouheyre, Bordeaux...	292
9. Bordeaux, Blaye, Saintes, Rochefort, La Rochelle, Nantes...	333
10. Nantes, Vannes, Quimper, Brest...	317
11. Brest, Morlaix, St. Briene, Dinan, Granville...	311
12. Granville, Valogues, Cherbourg, Barfleur, Valogues, Bayeux, Caen, Cabourg, Trouville...	314
13. Trouville, Quillebeuf, Le Havre, Etretat, Dieppe, Abbeville, Boulogne...	321
14. Boulogne, St. Omer, Cassel, Bailleul, Lille, Valenciennes, Landrecies, Charleville...	304
15. Charleville, Rethel, Vouziers, Sedan, Verdun, Pont-à-Mousson, Nancy...	287
16. Nancy, Paris...	309
	<hr/> 4,975

established repairers *en route*. That each day's journey should be completed between 5 a.m. and 7 p.m., that the cars should not carry observers, but should be "controlled" for the time of arrival daily.

In reply to these conditions, Mr. Siddeley wrote on May 5 as follows:—

"I have pleasure in informing you that the British club has acceded to my request asking them to appoint an observer in connection with this trial, as I have consistently refrained from participating in trials which have been held without the recognition of the Automobile Club.

Dealing with the conditions of the trial, I quite appreciate that this should be conducted under ordinary touring conditions. I note, however, with surprise, that you suggest that the vehicles shall pass through three or four different controls during the day, and thus have the regularity of running checked. Permit me to point out that I did not anticipate you had in contemplation any other system of checking than that of carrying an observer appointed by the other competitor on each of the cars. This, in my opinion, is much simpler than the suggestion contained in your letter, and one which will at the same time involve considerably less expense and be more fair to both parties. I have no doubt that you will fall in with this suggestion.

I beg to lay the following conditions before you as being those upon which the trial is conducted, viz.:—

1. The trial shall be carried out under ordinary touring conditions, and the car shall be an ordinary touring car as sold to the public, fully upholstered, but not necessarily finished as regards paint.
2. The car shall be under the observation of the contestant's representative from the commencement of the trial until the completion of the same.
3. A day's run shall not exceed 200 miles. A day shall be taken to consist of 14 hours from 5 a.m. to 7 p.m.
4. All stoppages of the car wheels shall be recorded. Voluntary stops shall be stops which the observer authorises, such as stops of the car or engine for legal requirements—traffic, meals, lighting lamps, fitting non-skids, tyre repairs, or for the convenience of observer or driver. The engine may be stopped while running down hill or during voluntary stoppages. All involuntary stoppages, and the reasons thereof, and the time occupied, will be noted by the observer. An involuntary stop shall mean any stop caused by failure of any part of the car or mechanism, or made for the purpose of carrying out any adjustment or repair which, if not carried out, might cause such failure. All stops for tyres, and the time occupied, will be noted.
5. The full complement of passengers or equivalent ballast, which shall not consist of spare parts, shall be carried throughout the run, and the total weight thereof shall amount to not less than 11 stone per passenger seat. The competitor shall be responsible for filling all the seats, except those for the observer.
6. The car shall be properly washed between the several runs, and the driver or mechanic may, at the close of each day's run, replenish the lubricators and tanks, and lift the bonnet and floor boards for examination, and no record will be made of the time so occupied, provided no tools are used, and that no adjustments or repairs be made. The time occupied in adjustments or repairs, either before or after a run, or during a voluntary stop, together with the nature of such adjustments or repairs, shall be noted.

Referring now to the method of arriving at a decision as to who shall have won the wager, I suggest the following conditions, viz.:—

Should either of the cars not have completed the day's journey through any mechanical failure, the other car shall be declared the winner.

The winning car shall be the one which has taken the least time during the trial in effecting repairs, either on the roadside or in the garage.

I trust that the foregoing will meet with your approval, as, of course, up to the present time we have not arrived at any definite basis upon which the wager shall be awarded, and it is with that object in view that these conditions are suggested.

I herewith enclose the regulations of the Automobile Club of Great Britain and Ireland in connection with long-distance trials. It was in a trial held under these rules that we claim that one of our cars holds the world's record for reliability."

M. Meyan, in his response on May 9, expressed surprise at the mere suggestion of there being anything but the veriest simplicity in the arrangements proposed by him of having daily controls. He thought that the cars should simply be driven in the ordinary course as they would be under ordinary touring conditions, and

that therefore it was quite unnecessary to take any notice of such matters as broken sparking plugs or pneumatic tyre troubles, &c., as these do not in any way affect the value of a car so far as reliability is concerned. All such matters should not enter into the competition at all. It was sufficient, he thought, if the cars during the 16 days could complete the journey set out day by day within the specified time. Therefore, no observers were necessary; and this procedure would be in accordance with the ruling of the French Club for their tourist contests, in which they have altogether done away with observers in favour of controls. Under this arrangement each day's journey would be divided into stages of about 50 kilometres each, which would have to be covered within a maximum time. There would be no difficulty about arranging for reliable controllers through the Touring Club of France. In regard to the cars being locked up nightly, M. Meyan states that there are many difficulties against such a course, as it would not be easy to find each evening a location where the cars could be really isolated. He preferred that each one's honour should be trusted to as a sportsman that nothing should be touched on the car during the night's rest. Summing up his views, he proposed the following conditions for the contest, mentioning that the car he would drive was a 4-seated 24-h.p. De Dietrich model which had already been driven 30,000 kilometres:—

1. The cars to be 4-seated ordinary touring vehicles, the seats fully occupied, and to be driven by gentlemen members of an automobile club.
2. Each day's journey to be about 320 kiloms. up to a total of 5,000 kiloms.
3. The start to be daily 5 a.m., the finish 7 p.m.
4. Repairs to be permitted, but only with the assistance of passengers on the car, during the day's journey of the vehicle.
5. Each day the journey to be divided into 6 sections of about 50 kiloms., each of which to be controlled as to time; a minimum average speed of 25 kiloms. per hour to be a *sine qua non*, two hours being allowed for luncheon.
6. The car which first failed to arrive at the end of the day's stages by 7 p.m. to be disqualified, and the match lost. The car which does not maintain an average of 25 kiloms. an hour over the various sections of the road, to lose the match. If both the cars comply throughout with the conditions, the match to be declared a "dead heat."
7. In case of illness, the drivers may be changed.
8. Each day, at the end of the journey, the cars to be simply washed, oil and fuel replenished, &c., each competitor undertaking in no way to touch his car except during the daily journeys whilst on the road.

Mr. Siddeley, being not desirous in any way to raise any difficulties likely to result in the match being declared off, loyally accepted these conditions on May 15th in the following letter:—

"I am quite in accord with your desire to simplify the terms of the match to the utmost, and with that object in view am prepared to agree to the articles set out by you as the basis upon which the winner of the match shall be adjudged.

In regard to the matter of Observers on the cars, I agree with you that there are difficulties in connection with this, and will therefore content myself with the following suggestion, to which I trust you will see your way to agree: that we carry a friend of each competitor on the cars, as an evidence of good faith, not as Observers, and who have nothing to do with the competition and the decision as to the winner; this decision being arrived at on the entries made by the control officials in the books carried by the competitors.

I have every confidence in making this request, as in any case I must ask you to appoint some person to travel on my car who is acquainted with the routes, and who would be of assistance in any difficulties, as my knowledge of French is quite limited.

A further point arises—if you can possibly arrange the matter, it would be well to have the cars locked up each night, so that no interested persons could possibly allege that the cars had been touched. In this matter you must, of course, appreciate that I am

at a considerable disadvantage, and therefore trust you will be able to arrange as I suggest. Of course, if the arrangements cannot be made, I am quite prepared to leave the matter in your hands, to arrange in the best manner possible.

In view of the Trial being held in France entirely, I trust that you will see your way to arranging for supplies of essence, oil, grease, &c., when required for my car. Had the Trial been partly run in England I should have been only too glad to make such arrangements for you. I am quite content to use the makes of these supplies as used by you.

Can you supply me with maps of the proposed route, and also contour maps showing the gradients of the various hills we have to cross during the trial. It has been suggested to me that the distance to be covered in the days we cross the Alps and the Pyrenees are very long. Is this so?

You will, of course, arrange for the control officials, whom I notice will be officials of automobile or bicycle clubs, or delegates of the Touring Club de France.

I thank you for the courteous information you afford me as to the car you propose to use. I, on my part, have pleasure in informing you that I propose to use my 18-h.p. car, constructed in 1904, and which has, I believe, run a much greater distance than even your car.

In conclusion, the only point I wish to raise in regard to the articles as set out by you is in relation to Clause 6 which states that the car which has not arrived at the conclusion of the final day's stage at 7 o'clock at night shall be disqualified and shall have lost the match. In this connection delays entirely due to tyres should not disqualify the car, as the match is a match of vehicles, not of tyres, and under any circumstances it would not be fair to either competitor to be disqualified on that account.

Further, in relation to Clause 6, delays in arriving at 7 p.m. due to taking wrong roads, of course, will not disqualify."

Nothing material, therefore, now remains but to wait patiently for July, when the daily journeyings of the rival champions should be followed with widespread interest.

Mr. S. F. Edge, when approached by Mr. Siddeley, at once withdrew his acceptance of M. Meyan's challenge, content to leave British interests in the safe hands of Mr. Siddeley.

Petrol Consumption Trial.—The final competition organised by the Wolverhampton A.C. for a silver cup, presented by Mr. T. T. Mills, took place on Saturday last, the course selected being Wolverhampton to Llangollen, a distance of 60 miles. There were 11 entrants, but 8 cars only started, carrying about 20 passengers. The formula adopted for placing the cars was:—

Weight of car, laden, in lbs. avoirdupois.

Petrol consumed in Fluid ounces.

The following are the results:—

Driver and Car.	Observer.	Points.	Miles per gallon.
S. R. Rhodes (16-h.p. Ariel) ...	K. Gatis ...	8 6/85	28.23
T. G. Gatis (10-h.p. Enfield) ...	F. Jefferson ...	7 41/50	30.47
W. G. Owen (10-h.p. Wolseley) ...	H. E. Price ...	7 13/25	27.42
G. H. Evans (10-h.p. Wolseley) ...	E. A. White ...	5 9/10	22.3
W. H. Evans (10-h.p. Wolseley) ...	H. Adams ...	5 14/25	20.75
A. Mills (12-h.p. Sunbeam) ...	A. Rodden ...	5 13/20	20.
T. T. Mills (12-h.p. Sunbeam) ...	P. C. Cannon ...	5 3/10	21.145
T. F. Young (15-h.p. Star) ...	M. Butt ...	5 9/25	17.7

All of these made the journey without any involuntary stops.

The Cup, therefore, goes to S. R. Rhodes as being the entrant of the car giving the best results under the formula.

THE Hill Climb of the Midland Automobile Club, announced for May 27th, has, we are notified, been postponed until June 3rd, when the contest will be held in the private grounds of Middle Hill, which is about 1½ miles from Broadway, Worcestershire.

South Harting Hill-Climb.—The regulations just issued for this tourist car hill-climb, taking place on June 10th, give particulars of the classification. There will be three classes, viz.:—

Class A, cars costing from £150 to £350. In this class cars up to £250 must carry 2 passengers, and over that amount 4 passengers.

Class B, for cars, the chassis price of which is from £300 to £500, to carry 4 passengers.

Class C, for cars, the chassis price of which is from £500 to £850, 4 passengers.

Entries can be made by members of the A.C.G.B.I. and its affiliated clubs. No car which has competed in an open competition for racing cars in the years 1903 and 1904 will be eligible to take part in the meeting. Cups are offered in each class, one each in Classes A and B by Earl Russell, and one in Class C by the Sussex County Automobile Club, whilst a second prize—the Club's silver medal—will be awarded in each class. The weighing takes place at Petersfield Goods Station, on Saturday June 10th, at 10.30 a.m.

Coupe du Loiret.—This endurance competition, as we mentioned last week, commenced on May 14th at Orleans, and concluded on Monday last. The contest was for tourist vehicles over a total distance of about 2,000 kiloms., to be run in eight stages over different routes, starting from and returning to Orleans each day. There were 16 starters on the first day, these dwindling down to 6 by the finish. On the fourth day the cars were timed on a hill-climb at Fontainebleau, and brake tests were also made, and the following day the cars were timed for starting their engines. The cars were also minutely examined in regard to suspension, stability, comfort, &c., all of which were important factors in determining the winner. Both the hill-climb and the starting times are given below:—

	Hill.		Starting.	
	m.	s.	m.	s.
30 h.p. Aries (Coquard)	2	35½	0	20
16 „ Prunel (Couverchel)	2	40½	1	10
10 „ De Dion (Cormier)	3	2	0	55
20 „ Berliet (Gayot)	3	10	2	10
16 „ Boyer (Loste)	3	10½	0	0½
6 „ De Dion (Montariol)	3	34	0	2½

The two De Dions ran throughout with remarkable regularity, and were easy favourites in the contest. The last day's run on the 22nd was about the hardest of the whole trial when 321 kiloms. were covered, bringing the total distance which the cars had run up to 2,006½ kiloms.

The results by categories is as follows:—

CAT. 1.—(1) 6-h.p. De Dion (Montariol).

CAT. 2.—(1) 10-h.p. De Dion (Cormier); (2) 16-h.p. Boyer (Loste); (3) 16 h.p. Prunel (Couverchel).

Vienna-Breslau-Vienna.—The tourist car trial, organised by the Austrian A.C., from Vienna to Breslau and back, a distance of about 800 kilometres, commenced the end of last week, when there were 25 starters divided into four categories according to selling capacity and horse-power. About 10 kilometres from Vienna, at Gross Geldersdorf, a speed contest over 1 kilometre was made, the best results of which were as follows:—Cat. 1, 7-h.p. Oldsmobile, 1m. 35s.; Cat. 2, 14-h.p. Bock and Hollander, 1m. 29s.; Cat. 3, 24-h.p. Mercedes and 24-h.p. Spitz (dead heat), 1m. 12½s.; Cat. 4, 70-h.p. Lohner-Porsche, 55s.

The first day's run was to Olmütz, the second to Breslau, followed by an Exhibition in that city next day, and the fourth and fifth days were devoted to the return journey to Vienna. On the second stage a hill-climb near Sternberg over 4 kilometres was timed, the best times in this being:—Cat. 1, 7-h.p. Oldsmobile, 9m. 43s.; Cat. 2, 14-h.p. Bock and Hollander, 9m. 9½s.; Cat. 3, 24-h.p. Mercedes, 5m. 20s.; Cat. 4, 60-h.p. Mercedes, 4m. 57s. Out of 26 of the starters from Vienna, 24 arrived at Breslau, the first in being:—Cat. 1, 7-h.p. Oldsmobile; Cat. 2, 12-h.p. Peugeot; Cat. 3, 24-h.p. Bock and Hollander. The third day's run on the return journey was again to Olmütz, Vienna being reached by the successful cars on Sunday last, 14 finishing with honours, these being:—Hieronymus (Spitz), Spanner (Mercedes), Trinkhaus (Dürkopp), Ruziska (Mercedes), Risch (Oldsmobile), Siercke (Regent), Zertlinger (Peugeot), Comte Boos (Mercedes), Karczag (Mercedes), Hildeshimer (Mercedes), Franz (Regent), Brunnbauer (Peugeot), Mulch (Darracq).

Brescia Automobile Meeting.—The Chevalier Florio, whose trophy will be raced for next September, on the Brescia Circuit, now announces that during the Brescia Week he has arranged for a special race, twice round the Circuit, for tourist cars on the day following the Florio Cup Race. There will be three categories: (1) under 20-h.p., (2) 20-40-h.p., and (3) 40-60-h.p.

RULES have been issued by the A.C. de France for the general government of tourist trials in France. The categories specified are by cylinder capacity as follows:—Cat. 1, under 2½ litres; Cat. 2, 2½ to 3½ litres; Cat. 3, 3½ to 7½ litres; Cat. 4, above 7½ litres. For each of these the weight of the car fully equipped, but without passengers, must conform as follows: Cat. 1, minimum 700 kilogs.; Cat. 2, 1,000 kilogs.; Cat. 3 and 4, 1,300 kilogs. In each category the vehicles are sub-divided into (1) open cars (2) cars with a screen, and (3) closed cars. General rules and instructions are given in the rest of the regulations in regard to minimum distances to be allowed for trials, maximum speeds, starting, weighing, and all the other usual formalities.

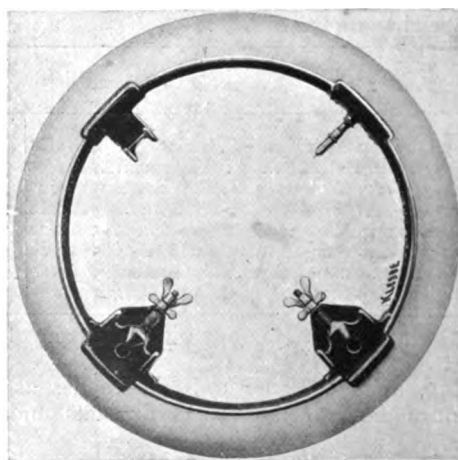
A "CARAVAN" is being organised by *Les Sports* through France for August. It will be reserved for tourist cars entered and driven by their owners, and it is proposed to make a long tour through the most picturesque portions of France over a distance of about 3,000 kiloms., and occupying some fifteen days. Speed will be limited, and each day there will be a hill-climb, and an official speed test; 20,000 francs are offered in prizes, the classing will be by cylinder capacity, and the entrance fee is 100 francs per vehicle.

Vanderbilt Cup.—The German Club have entered five cars for this race. Last week we gave particulars of the French and American entries to date. In America it is stated that probably the course on Long Island will be modified from last year, in order that the stops at Hicksville and Hempstead may be avoided.

Long Distance Records.—We published in our issue of May 13th the new 1,000 miles record completed on May 6th by Wridgway, at New York, driving a 24-h.p. Peerless car. From further information now to hand the records of Wridgway on that day were from 100 miles upwards, on the Brighton Beach track, Coney Island. The mileage covered in the first 24 hours was 934, which is 123 better than has been accomplished before. The timing, it is stated, was in the hands of capable persons, and the new times in hundreds up to 1,000 miles were as follows:—

Miles.		h. m. s.	Miles.		h. m. s.
100	...	2 9 44	600	...	15 17 15
200	...	4 43 4	700	...	18 9 59
300	...	7 4 40	800	...	20 55 36
400	...	9 25 19	900	...	23 28 36
500	...	12 20 34	1000	...	25 50 1

Morris Park (New York).—On Saturday last, the Motodrome at Morris Park was inaugurated, when a very large concourse assembled to witness the racing. In a match over 5 miles, Basle, on Bowden's 90-h.p. Mercedes, twice easily beat Barney Oldfield on a 50-h.p. Peerless, in the times of 5m. 34½s., and 5m. 58½s. In a 3 mile open race, Chevrolet, on a 90-h.p. Fiat, was first, in 2m. 51½s., his time over a mile during the race being 52½s.



THE STEPNEY "WHEEL."—An ingenious device has recently been placed on the market by Davies Bros., which consists of a supplementary tyre and rim complete, for use in emergency, when a tyre punctures. The rim is provided with clamps which enable it to be easily fixed to that of the existing wheel. These clamps are so arranged that they grip the ordinary rim, and a special clamp is provided for taking the "drive" from one of the spokes of the wheel. In the event of a puncture it is, therefore, unnecessary to repair or replace the tyre en route, because the Stepney "wheel" can be fixed alongside, and its tyre then takes the weight of the vehicle. Our illustrations show the "wheel" in use and also separately.

MOTOR CYCLING.



The Tooley Bi-car.—This unique form of bicyc'e has been designed to allow access to the saddle from the front, and also with the object of isolating the vibration of the front wheel. For the latter purpose, the wheel is mounted independently of the handle bars, and is carried in specially-constructed bearings which allow the wheel to tilt when being steered. Jointed rods are used to connect the front axle to the lower end of the steering column. The frame is of most peculiar design and the principal member is carried right round the front of the steering wheel.

International Cup Race.—On Wednesday morning next, starting probably about 3 a.m., in the Isle of Man, the Selection Race for the machines to represent Great Britain on the Dourdan Course in this race for motor cycles will take place, the race probably finishing by about 8 o'clock in the morning. We repeat the list of official entries for the guidance of those who are attending the races in the Isle of Man.

Entrant.	Machine.	Rider.
1. C. Jarrott ...	6 h.p. J.A.P.	W. Hodgkinson.
2. Rev. B. H. Davies	8 " Westlake	H. P. Maffert.
3. H. Collier ...	6 " Matchless	C. R. Collier.
4. H. Collier ...	6 " Matchless	H. A. Collier.
5. H. Rignold ...	8 " Rignold	H. Rignold.
6. E. F. Johnson ...	6 " Humber	J. F. Crundall.
7. A. B. White ...	9 " Roc	A. B. White
8. Sir A. Conan Doyle	9 " Roc	T. Tessier.
9. C. B. Franklin ...	6 " J.A.P.	C. B. Franklin.
10. O. L. Bickford ...	6 " J.A.P.	O. L. Bickford.
11. A. A. Hay ...	6 " Ariel	J. F. Campbell.
12. W. A. Richards ...	12 " Barry	A. M. Schreyer.
13. W. A. Richards ...	12 " Barry	J. Thornton.
14. W. A. Richards ...	12 " Barry	—
15. G. A. Barnes ...	10 " Barnes	G. A. Barnes.
16. G. Wilton ...	10 " Barnes	G. Wilton.
17. Rev. B. H. Davies	8 " Westlake	A. Westlake.

No less than seven of the entrants are private owners, who are taking part in this purely from sporting motives, in the interests of the British motor cycle industry. These are Mr. Charles Jarrott, the Rev. Basil H. Davies (who has entered two machines), Mr. A. B. White, Sir A. Conan Doyle, Mr. C. B. Franklin, and Mr. O. L. Bickford.

THE French Eliminating Trials have, it is officially stated, been postponed until June 11th, in consequence of the Prefect of Seine et Oise finding it impossible, owing to the presence of the King of Spain in Paris on June 4th, to tell off sufficient officers to look after the course for the protection of the public.

THE Austrian Eliminating Trials take place to-morrow, Sunday, when the route of the trials will be over a circuit of 61 kiloms. with two neutralisations. The points touched will be Pacow, Obratany, Kamen, Cizkow, Ceroena, Recice, Horepnik, Pacow. Six machines are entered for the trial, viz., 2 Laurin-Klement, 2 Johann Puch, and 2 C. Linzer. Only two places are open for selection, as the Austrian Motor Club have decided that the first place in the race, as we announced many months ago, shall be taken by a Laurin-Klement, by reason of that having been the only firm who entered last year to uphold the Austrian colours.

By means of a motor cycle for pacing, W. T. Hall was enabled, on Saturday last, to break the 10-mile cycle record at the Crystal Palace by 45½s., covering the distance in 13m. 32½s.

Glasgow Motor Cycling Club Hill-Climb.—This club inaugurated its competition season last Saturday with a hill-climbing contest on Fintry Hill, near Lennoxtown, which formed one of the hill-tests during the Glasgow Exhibition trials four years ago. The part of the hill selected is about a mile and three-quarters in length, has an average rise of 1 in 15, the steepest part being about 1 in 10. There were 50 entries, and the machines were divided into five classes according to cylinder capacity, the arrangement being that a gold medal should be awarded the fastest machine in each class. Of the 50 entered, 39 started, and it is a curious reflection on the gearing of these machines that only 16 succeeded in climbing the hill. Notwithstanding plenty of power for the purpose, the owners with the object of securing speed on the level, gear the machines so high, from 3½ to 4½ to 1, that such a moderate test as that mentioned is too much for them. A large crowd had gathered to see the racing, and it was on the whole highly interesting. Campbell, of Greenock, who rides an Ariel 2-cylinder machine in the Isle of Man selection test was present with the machine, and succeeded in climbing the hill at a speed of about 20 miles an hour on a second attempt. Two tries were permitted, the best of the two to be taken. The start was standing but slightly down hill, and pedalling was only allowed for about 50 yards. Results:—

CLASS I. (Cylinder capacity not exceeding the equivalent of 70 mm. by 70 mm.). Five started; 3 finished. Riders in this class only were permitted to pedal all the way.

	Time.
1. Wm. Hutchinson ... 1½-h.p. Clement-Garrard	7m. 5s.
2. John Cadwell ... 2-h.p. Clement-Garrard	7m. 17s.
3. D. McCillum ... 1½-h.p. Ormonde	9m. 8s.

CLASS II. (76 by 76). Four started; 1 finished.

	Time.
1. Arthur Reid ... 2½-h.p. Minerva	6m. 40s.

CLASS III. (80 by 80). Fifteen started; 4 finished.

	Time.
1. C. B. Ferguson ... 2½-h.p. King	6m. 9s.
2. John Falconer ... 3-h.p. Centaur	6m. 59s.
3. J. S. Bryce ... 3-h.p. Quadrant	8m. 1s.
4. John Roberts ... 2½-h.p. Bradbury	9m. 10s.

CLASS IV. (85 by 85). Twelve started; 5 finished.

	Time.
1. F. C. Holms ... 3½-h.p. Brown	5m. 35s.
2. A. E. Holms ... 3½-h.p. Ariel	5m. 48s.
3. R. L. Sandeman ... 3½-h.p. Ormonde	6m. 21s.
4. Alexander Jarvie ... 3½-h.p. Wolf	6m. 36s.
5. William Comery ... 3½-h.p. Holloway	6m. 47s.

CLASS V. (85 by 85). Three started and finished.

	Time.
1. J. S. Campbell ... 6-h.p. 2-cylinder Ariel	5m. cs.
2. Charles E. Bell ... 5-h.p. 2-cylinder Kerry	5m. 27s.
3. R. Donald ... 5-h.p. 2-cylinder Peugeot	5m. 27s.

Auto-Cycle Club.—A meeting of the representatives of the motor cycle trade will be held at the Automobile Club, 119, Piccadilly, on Tuesday, June 6th, at 7 p.m., to elect representatives of the trade on the 1,000 Miles' Trials Advisory Committee, and to fix a date for the trials.

Irish Motor Cycle Union.—Ten members took part in the reliability run from Dublin to Dundalk on Saturday last. The distance was 50 miles, and the conditions as on former occasions, full marks being awarded to every competitor doing a non-stop run. A mark to be deducted for every stop on the road, no matter from what cause. The pace not to exceed 20 miles per hour, and not less than 15. Sharp to time ten competitors were dispatched from the Tolka Bridge, Drumcondra, and of these seven reached Dundalk without a stop. Guilfoyle (2½-h.p. Liberty) was first to meet with trouble: soon after the start the belt came off, and finding matters beyond temporary repair retired from the contest. Oakes (2½-h.p. F.N.) was next to cry enough, which he did on the hill leading out of Drogheda, the stop in his case being caused through the air-cooling fan of his fore car; and soon after Brannigan (2½-h.p. F.N.) found his sparking-plug required attention and stopped; the remaining going through reached the checking station outside Dundalk well inside the time limit, and received full marks as under:—

J. B. Dunlop...	2½-h.p. F.N.	100 marks.
T. W. Murphy	3-h.p. Singer	100 "
V. Mayne	2½-h.p. Bradbery	100 "
W. Christie	2½-h.p. Griffon	100 "
E. A. Bannister	2½-h.p. Minerva	100 "
W. H. Meredith	2-h.p. Triumph	100 "
Gerald Mayne	3-h.p. Singer	100 "



CLUBS AND ASSOCIATIONS.

Ladies' A.C.—Entries for the Gymkhana of the Ladies' Automobile Club, which is to be held at the Ranelagh Club, Barnes, on July 1st, close on June 24th. Only members of the L.A.C. are eligible for the competition. The events will comprise a Bending Race, a Crawling Race, a Bomb Race, and an Appearance Competition. First and second prizes will be given for each item on the programme. The full course is about ½ mile over the grass.

The club run to Homburg—which was organised by Mrs. Gerard Leigh last year—proved such a great success that the committee are arranging for the members to have a trip this year to the Auvergne Course.

Members will start from Folkestone for Boulogne on the evening of the 30th June. In Boulogne the 1st July will be spent obtaining the necessary driving and circulation permits. The distance, some 377 miles, from Boulogne to Paris, Paris to Nevers, and Nevers to Royat, will be comfortably covered in two and a half days, the last-mentioned town being reached on the afternoon of the 4th.

The club's headquarters will be the Continental Hotel, Royat, where members can secure rooms and full board at special terms.

It is hoped that after the race many of the members will journey slowly homewards together through the land of the famous chateaux.

Marine Motor Club.—At the first committee meeting of their newly-formed club the chief business was the election of members, no less than seventy-five being now fully enrolled. The sub-committees were elected to deal with the programme of events for 1905, and a house committee was elected to go into the question of the club house which it is proposed shall be at Southampton. A sub-committee was also appointed to obtain and sift applications for the post of secretary to the club. A number of other matters were considered, and the sub-committees are now going into the details, and it is certain that very great progress will be reported to a general meeting which will be held on June 19th.

Roads Improvement Association.—On Wednesday of last week, although this Association has now been in existence nearly twenty-one years, the first dinner of the members took place at the Trocadero Restaurant, when the chair was occupied by the Hon. Earl Cadogan, supported by the Hon. Arthur Stanley, the vice-president and chairman of the A.C.G.B.I.; Mr. R. Todd, chairman of the Association; Colonel Holden, Colonel Crompton, Messrs. Roger W. Wallace, K.C., Sidney Straker, G. L. Gomme, F.S.A., T. Lough, M.P., A. Moresby White, Dugald Clerk,

Motor Cycling Club 200 Miles Reliability Trial.—On Saturday last the contest organised by this club for the Reeves' Challenge Cup and Trophy over 200 miles was run off, starting from Watton to Broadwater, Stevenage, Royston, Puckridge, Wadesmill, back to Watton. 22 started out of 27 entrants, the send-off being given at 5 a.m. Several of the competitors fell out before the first 20 miles had been completed, whilst at 50 miles all had been eliminated with the exception of eight. 45 minutes were allowed for lunch at the conclusion of the first 100 miles, when the second lap of 100 miles had to be completed. Of the eight starters on the second 100, six completed the 150 miles and five were timed for the full 200, viz., Messrs. Jilsley, Lowe, Hall, Hulbert, and Brice. For the purpose of deciding the winner amongst these five, a supplementary contest was run off on a road about a mile outside Watton. This consisted of a hill-climb over a distance of about 300 yards, and a combined short speed trial and brake test on the level. The machines had to be driven at the fastest possible speed and stopped as far as possible dead on the finishing tape. Any distance either beyond or short of this line entailed penalisation, marks also being awarded for this test. As a result of this, the placing was as follows: (1), Lowe; (2), Brice; (3), Hall.

Before running off the contest, permission had been granted by the Chief Constable of Hertfordshire to drive over the specified roads, one of the stringent rules of the competition being that disqualification immediately followed any excess of speed over the legal limit.

Motor Cycle Tour de France.—The official figures giving the results for the competitors in this event have now been issued. Except that the points are slightly altered, the positions of the various cars in the competition are identical with those given by us last week on page 633. We do not therefore re-publish the list as now officially issued.

A.M.I.C.E., E. R. Shipton, W. Worby Beaumont, C. Ashton Johnson, R. E. Phillips, &c.

After the loyal toasts had been duly honoured, the toast of "The Roads Improvement Association" was given by Mr. Gomme and responded to with some interesting reminiscences by Mr. Robert Todd, Mr. Rees Jeffreys, the secretary, being subsequently called upon by the chairman also to speak.

Mr. Jeffreys, in a convincing and rousing speech, pointed out how important was the question of improvement of roads, and how bound up with this highway question were the housing, motoring and several other important problems of the present day. In spite of all this, however, the whole subject was until quite recently one of complete indifference to the highest authorities in the land, dealing with highway administration. Over 100 guests were present at the dinner.

West Surrey A.C.—About sixteen members and friends met at the Castle Hotel, Windsor, for lunch on the 20th inst., among those present being Messrs. Crowthers, on a Darracq; Mr. Fletcher and party, 20-h.p. Durkopp; Mr. and Mrs. Pullman, 15-h.p. Durkopp; Mr. Robertson and friend, 6-h.p. Wolseley; Mr. Warne, Mrs. Bullard, and Dr. Henderson, on Dennis cars; and Mr. and Mrs. Buttemer and party on a 10-h.p. Decauville. Later on, the chairman of the club, Col. Fairtlough, with Mrs. Fairtlough and friends on board, joined the party after a longer run. Mr. J. F. Ochs had invited the club to tea at Chertsey on their homeward journey, but was unfortunately unable to be present, and the party were most hospitably entertained by Mrs. Ochs, a pleasant hour being spent at their beautiful and historical residence.

We are officially notified that the Hon. C. S. Rolls (Messrs. C. S. Rolls and Co.) and Charles Jarrott, Esq. (Messrs. Jarrott and Letts, Limited), have tendered their resignations as members of the British Empire Motor Trades Alliance. Whilst they strongly sympathise with the objects of the Alliance they consider that their trade interests at the present moment do not justify their continuing as members, but they hope at an early date to increase their British interests sufficiently to allow them to rejoin and become active members. For the same reason Mr. Claude Johnson, to whose initiative the Alliance owes its formation, has tendered his resignation as honorary secretary. The committee desire to record their appreciation of the valuable honorary services rendered by Mr. Johnson, and they hope that he, too, at an early date will have acquired the necessary qualifications to rejoin.

MOTOR BOATING.

Motor Boat Reliability Trials—Seven boats have now been formally entered for these Trials, entries for which close on June 24th. They are:—

Maudslay Motor Company, 30-ft. yacht's launch.
Kensington Motor Boat Company, 40-ft. sea-going yacht.
J. M. Gorham, 30-ft. cruiser.
Mr. Steuart Foster, 30-ft. cruiser.
Captain T. R. Dixon, two 30-ft. cruisers.
Lord Howard de Walden, 12-metre Napier.

Messrs. S. F. Edge and Messrs. J. W. Brooke and Co., in addition to these, have also entered for the Trials. Messrs. S. F. Edge, Limited, will be represented by a 55-h.p. 60-foot Yarrow-Napier boat and Napier Major in the cruiser class, also a 20-h.p. 30-foot boat, entered by Lord Royston. It is hoped that the entries will ultimately total up to about 40.

APPLICATIONS are desired for the post of secretary to the Marine Motor Club of Great Britain and Ireland. Applicants should have considerable knowledge and experience of yachting; organising capacity and a fair knowledge of French. Knowledge of steam or internal combustion engines is desirable, but not a *sine qua non*. Applications should be sent without delay to the Secretary, Marine Motor Club, 119, Piccadilly, W.

Algiers-Toulon Motor Boat Fiasco.—One of the abandoned craft, viz., the *Quand Même*, has now been recovered, the craft having been found drifting at Bizerta in Tunisia, the boat appearing to be little

damaged. The *Camille* has also been sighted drifting about with the current in the same direction. An attempt at salvage by Capt. Marinetti, of the mail steamer *Ville de Madrid*, was unsuccessful, the *Camille* ultimately having to be again abandoned.

WE are able this week to give a picture of the *Camille* during the storm, when her crew was so providentially rescued by the torpedo boat conveying her.

MADAME DU GAST, nothing daunted by her fearful experience, has already announced her intention to take part in next year's race, wherever it may be determined it should be held, and, moreover, she further states that she will be steering a boat in the Boulogne-Folkestone race, and will also be at the wheel of a car for the Florio Trophy on the Brescia Circuit in September.

IN regard to the course for 1906, in all probability this will be changed, and a possible starting point, with the finishing point at Toulon, will be Genoa.

Paris to the Sea.—In a recent issue we referred to the duplication by *Les Sports* of the *Journal de l'Automobile's* "Paris to the Sea" event. It has now been officially decided by the A.C. de France that the *Sports* race is not to be officially recognised or timed, as we suggested would be the case. The *Journal's* event, however, is, as in previous years, to be officially recognised. *Les Sports* have now taken "Rouen-Trouville" as a distinguishing title for their Coupe de Trouville, taking place on July 25th or 26th.



No. 1 Brotherhood Car, with Mr. Percy Richardson at the wheel. This car has already completed a distance of 9,000 miles.

IT speaks well for designers and manufacturers when their first car proves so entirely successful that it can continue to be used for demonstrating the advantages of the latest vehicles to the buying public. The "Brotherhood" car shown in the photograph on this page was the first turned out by the Brotherhood-Crocker firm, and it has, we learn, now covered nearly 9,000

miles without showing signs of any undue wear. Both it and Mr. Percy Richardson, who is seated at the wheel, will be recognised by quite a large number of our readers, for we understand that many hundred motorists have been given trial runs on it. A very complete, and fully illustrated, description of its construction appeared in our columns on February 4th to March 25th inclusive.



Miss Emma Eames, the famous Prima Donna, is a devotee of automobilism. Miss Eames is bringing to Europe her new Peerless Car, in which she is seen seated in our photograph, and proposes during the summer to tour throughout Europe.

EARL RUSSELL last week was "called" to the Bar by the Honourable Society of Gray's Inn.

FROM the Colhill Hotel to Dunton Green, on the main road to Sevenoaks, is a point to be avoided by automobilists, the police having selected this as one of their happy hunting grounds.

HIS MAJESTY THE KING has recently added to his motor car stud one of the latest creations of the Cannstatt firm, viz., a 40-h.p. Mercedes. The new Royal car is being housed at Buckingham Palace, and is mainly intended for travelling between London and Sandringham. As driver of his new acquisition the King has engaged a chauffeur specially trained at Cannstatt.

THE reckless valour of pugnacious bulls, much though we admire it in principle, is becoming something of a terror to the motorist, as we have now to chronicle a third occasion within the last couple of weeks on which a bull has regarded an approaching motor car as an opponent worthy of his horns, and accordingly charged it with disastrous effects. An event of this kind occurred recently to Captain Trippell, of Onslow Hall, Richmond, who was driving into Petersham on his automobile, when a bullock he met on the road lowered its head and charged full tilt at his car, breaking the front lamps.

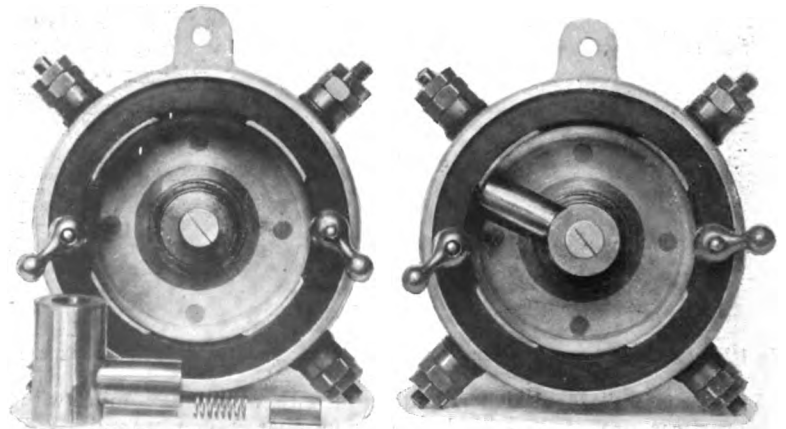
LORD HOWARD DE WALDEN, not content with the purchase of a petrol-

driven racing boat, has now given instructions to Simpson, Strickland, and Co., Limited, of Dartmouth, to fit their steam machinery to his last year's craft, *Fer-de-Lance*. This boat, it will be remembered, was fitted with internal-combustion engines, and entered for the International Cup Race of 1904, but the engines did not prove satisfactory. The boat, when re-engined, will be entered for the Monaco events next year.

SUCH good feeling has hitherto prevailed between local automobilists and the Nottinghamshire police, that the Nottinghamshire Automobile Club has been particularly annoyed by one or two instances of recent reckless driving which have occurred in the neighbourhood, and of which complaints have been made to them by the police. The club naturally feel that it would be the greatest of pities should the good feeling and consideration which the police have hitherto shown be in any way interfered with, and they have accordingly drawn up a circular

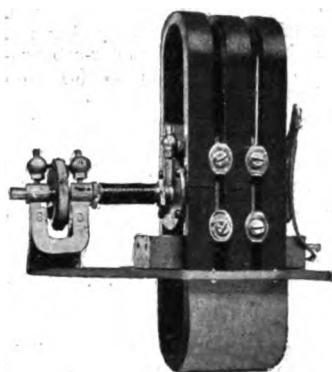
on the subject, drawing attention to the serious injury done by want of consideration, and have sent it to all their members and the Press.

THE "Annuaire Générale de l'Automobiles for 1905," published by Messrs. Thevin and Houry in Paris, is to hand. This is a very valuable work, particularly in regard to Continental automobile matters, as it is a complete directory with addresses of constructors of cars and accessories, garages, hotels, &c. This book contains 1,500 pages and the addresses of about 20,000 proprietors of carriages. The work is published at 16s., post free.



Those who find their experience with roller-contact commutators unsatisfactory, will be interested in the conversion from "roller" to "brush" contact which is carried out by Mr. E. H. Lancaster, of the Clément Company. Our illustration shows an ordinary La Coste type commutator which has been adapted to use an ordinary brush contact instead of the roller originally fitted.

The Rankin Kennedy High Tension Magneto.—



The latest form of this magneto has, it will be noticed, two opposed sets of "horseshoe" magnets instead of the single set previously used. The peculiarities of the Rankin Kennedy High Tension Magneto Ignition system (described in our issue of November 5th, 1904) are that the magneto may be frictionally driven, and that it is not intended to be "set"

relatively to the engine as are other magneto machines.



PUBLICATIONS RECEIVED.

The Institute of British Carriage Manufacturers. Twenty-third Annual Report, 1905. 1, Queen Victoria Street, E.C.

C. B. Fry's Magazine. June. London: George Newnes, Limited. 6d. net.

I. M. D., 1905 (Irish Motor Directory). Dundalk: W. Tempest. Price 1s.

Annuaire Generale de l'Automobile, 1905. Paris: Thevin and Houry. 16s.

Catalogues.

Lucas Motoralities, 1905. Joseph Lucas, Limited, Birmingham.

Motor Lubrication, 1905. Joseph Lucas, Limited, Birmingham.

"The Motormeter." Elliott Brothers, Leicester Square, W.

The Heron-Aster Cars. The Heron Motor Company, Birmingham.

"Mercedes Points." Cannstatt Mercedes, Limited, Long Acre, W.C.

Automobilists will be pleased that the *Isle of Man Times* is opposed to the retrograde action of the House of Commons in limiting the speed of motor cars in the island to 14 miles an hour. Says our very sensible contemporary:—

Why it should be about one-third less here than across the water it is difficult to imagine. Indeed, along with many others, we very much doubt the wisdom of fixing a speed limit at all, and are inclined to think that the safety of the public would be better safeguarded by omitting all reference to speed, and by providing strict regulations and the severest of penalties for reckless driving to the danger of the public. On the crowded promenades of Douglas on a summer evening five miles an hour might be a dangerous speed, but on the same district at five o'clock in the morning ten times that speed could, so far as the public are concerned, be safely indulged in.

That is the case in a nutshell, for as we have already pointed out, considering the benefits which automobilism has conferred on the island, the action of the Isle of Man Parliament is uncalled-for, to say the least, especially as we have always been led to regard that body as a particularly progressive assembly.

THE 3½-h.p. Phoenix Trimo which was the only passenger machine to get through the 1,240 Miles Reliability Trial of the Auto Cycle Club of France was, we learn, fitted with the Simms-Bosch high-tension magneto ignition.

COMMERCIAL POINTS.

THE Daimler car has been busy scoring successes during the past few weeks. At the American Automobile Club Races at Brighton Beach, Coney Island, U.S.A., a 30-h.p. Daimler was the winner of Event No. 1, and secured second place in Event No. 4. In the Scottish Touring Trials a 30-h.p. Daimler made the fastest time up the celebrated Spittle of Glenshee Hill. On May 6th, at the Cultra Hill Climb of the Royal North of Ireland Yacht Club, the Daimler car obtained first prize, whilst at the Hill-Climbing Competition of the Derby and District Automobile Club the fastest time was made by Mr. F. A. Bolton on a 30-h.p. Daimler, and the second fastest time by Mr. Leech on an 18-h.p. Daimler. The Daimler Motor Company has always resolutely set its face against mere time racing, but where reliability or efficiency has been regarded as a test the Daimler cars have scored high points.

THE fire that broke out last Thursday at the London premises of United Motor Industries (Limited), 45 and 46, Poland Street, W., was mainly confined, through the prompt action of the Fire Brigade, to the top floor. The repair department will be temporarily disorganised, but the supply of goods will in no wise be affected, which fact traders throughout the Kingdom will be glad to hear at this busy season. Whilst the flames were raging on the top floor, Mr. H. K. Hales, motor agent, of Burslem, was calmly buying motor lamps on the first floor. Mr. Hales is not the man to allow either excitement or pleasure to interfere with business.

ANOTHER large and well-equipped automobile factory has, we learn, now been opened in the west of London for the manufacture and repair of motor cars. These are the Acton Hill works of the New Engine Company, who will shortly be placing a 25-30-h.p. car of a novel character upon the market.

MR. H. B. FITZHERBERT advises us that the Young Street Motor Garage at 11, Young Street, Kensington High Street, has just been opened for business. The premises are thoroughly suited as an up-to-date garage, and the company are making a feature of letting on hire high-class cars, either for short or long periods. Repairs of every description, charging of accumulators, &c., can be carried out on the premises, and oil, petrol, and a large stock of accessories are always on hand.



In several directions, drivers are being trained for the large demand which is now arising for competent men for the new motor omnibuses which are daily being added to the London streets. In the photograph given above a case in point is seen, Mr. Warren Smith, of Hewetsons, Limited, is training a number of the drivers of the London General Omnibus Company, for the purpose of enabling them to take in hand the Crossley-Leyland Omnibuses which are to be put on the road by the Company. These men are instructed in batches of four at a time. Mr. Warren Smith finds them quick and intelligent in learning their new duties, and he considers they will make admirable drivers. Besides Mr. Warren Smith and the four drivers on the car, Lieutenant-Colonel Elton Burroughes, manager of Hewetsons, Limited, is at the tail end of the chassis, and Mr. J. S. Critchley, the designer of the Crossley engine, is standing by the side of the driver.

DURING the Isle of Man Eliminating Trials Dunlop motor tyres can be obtained from Messrs. Brook and Co., of Parliament Street, Ramsey, or from the representatives of the Dunlop Company at the Athol Hotel, Douglas.

THE Sirdar Rubber Company, Limited, write us as follows:—*Re* price of royal Sirdar buffer tyres and royal Sirdar non-slipping puncture-resisting tyres.—Since the many notices of the various tyre companies with regard to the rise in prices of tyres, we are frequently asked if our prices have been altered, and we may mention that, although we have not at present made any alteration in the price, we are seriously considering the matter, and shall be obliged if you will make this known to your readers.

MR. WILLIE TISCHBEIN, the old racing cyclist, is about to start on a tour through the United States in the interest of the Continental Tyre Company.

THE Woodstock Municipality near Cape Town have just placed an order with the Lancashire Steam Motor Company, Limited, of Leyland, for two of their municipal steam motor tip-wagons. These are replicas of eight machines supplied to Messrs. E. Nuttall and Co., in Cape Town, and one to the Greenpoint and Seapoint Municipality, also near Cape Town. In addition, the Lancashire Company are sending out two of their standard petrol motor omnibuses to Australia.

THE 10-h.p. Ford car which was entered by the Central Motor Car Company, Limited, of Long Acre, in the Glasgow Trials, after having finished the official ordeal in Scotland, started for London, we learn, under similar conditions to those imposed by the Scottish club in their trials. This resulted in a "non-stop" run from Glasgow to London, the car having thus covered more than 1,000 miles, when it was found in as perfect running condition upon arrival as when it started.

NEW COMPANIES REGISTERED.

Buckingham Gate Motor-Hansom Company (Limited).

—Capital, £2,507 in 25 shares of £100 each and 7 shares of £1 each. Formed to carry on the business of motor-cab proprietors, engineers, &c., and to adopt agreements (a) with G. Stephenson, and (b) with G. Stephenson and A. Glenn.

Millennium (Limited), 15, Poultry Chambers, E.C.—Capital, £1,000 in 5s. shares. Formed to acquire inventions relating to portable electric lamps, absorbent storage batteries, and automatic puncture-closers for pneumatic tyres, and to acquire the patents and goodwill of the British Steam Traction Syndicate, Limited.

Motor-Boat Club of Great Britain and Ireland (Limited), Dudley House, Southampton Street, W.C.—Registered with 20 members, each liable for £1 in the event of winding up.

Scowen (Limited), 840, King's Road, Reading.—Capital, £1,000 in £1 shares. Formed to carry on the business of constructors of engines, launches, and mechanically-propelled vehicles, &c. First directors, V. J. Scantlebury (chairman) and W. E. D. Owen.

Thermal Engine Company (Limited).—Capital, £3,000 in £1 shares (1,000 preference). Formed to acquire from A. E. Beck certain inventions relating to machinery and apparatus for power and heat production, in respect of which provisional specifications have been filed—viz., No. 28,833 of 1904, for improvements in engines worked by heated products of combustion, and No. 1,329 of 1905, for an improved method of treating fuel for power production.

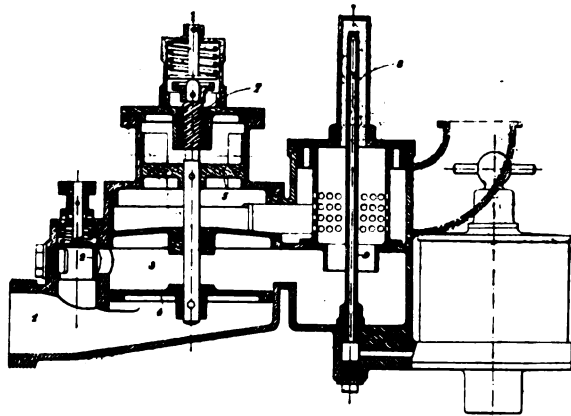
Waterford Road Car Company (Limited), 3, Catherine Street, Waterford.—Capital, £5,000 in £1 shares. First directors, the Marquess of Waterford, K.P., Mr. W. G. D. Goff, D.L., Sir James A. Power, Mr. Richard W. Morris, and Dr. E. F. Stephenson.

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, Temple Bar, London.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

29411. 31st December, 1904. Improvements in connection with Carburettors for Internal Combustion Engines. Louis Renault, 139, Rue du Point du Jour, Billancourt, Seine, France. Date under International Convention, 3rd December, 1904. This invention relates to carburettors which are automatic in their action, in which the liquid hydrocarbon is kept at a constant level, and a supply of additional air is regulated by means of a disc

exerted by the motor. This variation of supply results from the variation of level produced in the nozzle tube by the suction of the piston or pistons. Thus with a low speed of the motor the petrol will rise but little in the nozzle tube because the suction is slight, but with increase of speed in the engine there is increase of suction, and the petrol rises in the nozzle and passes through the higher apertures. May 4th, 1905.



capable of moving in a chamber, and having an area slightly less than the cross sectional area of the body of the chamber. There are two figures. Fig. 1 is a sectional elevation in a central plane. The valve, 2, is placed between the air supply pipe, 1, and the chamber, 3. The disc, 4, and the valve, 5, are fixed to the spindle, 7, which is provided with a quick-thread screw. The spraying-nozzle, 8, is of considerable length, and is provided with a lower aperture, 9, placed at two or three millimetres above the constant level of the petrol, and above the first or lower aperture the nozzle has other apertures, arranged at varying heights in the tube. These apertures cause the carburettor to be supplied with petrol in quantity varying with the power being

10095. 3rd May, 1904. Improvements in or relating to Brakes, Clutches, Speed Regulators and the like. R. Lindsay, of Dundee, R. F. Sturrock, of Dundee, and G. C. Douglas, of Newport, Fife. The object of this invention is to provide means for gradually causing a relative motion of two or more parts to synchronise or tend to synchronise. There are three figures. Fig. 1 is a sectional elevation of the apparatus as applied to a brake or clutch for a motor car. A shaft, 11, is fitted within a circular case, 10, a gland, 12, being fitted to the shaft, 11. Fixed to the shaft within the casing is a toothed wheel, 13, which gears into a toothed pinion, 14, pivoted on the pin, 15. The rotation of the shaft, 11, with its wheel, 13, will cause the pinion, 14, to

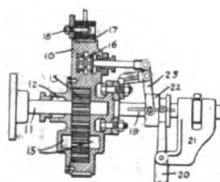


FIG. 2

rotate, if the case is held from rotating, and the pinion's rotations may be varied by allowing or causing the case, 10, to slip round or rotate. The wheel, 13, and the pinion, 14, fit closely in the case, and their teeth also fit into one another, the whole moving surfaces being machine-finished. In the case is fitted a valve, 16, and the case is filled with oil. The arrangement is such that, when the valve, 16, is open and the spur wheels, 13 and 14, are rotating, the oil can freely circulate in a passage in the case through the valve opening and round past the wheels, but when the valve is partially or wholly closed the circulation is either impeded or stopped, so that the rate of rotation of the pinion, 14, is varied relatively to the driving wheel, 13, and the case, 10, must rotate in proportion to the lessened or increased rotation of the pinion, 14. If the case be attached, say, to the car wheels by means of the shaft, 19, its rotation can be governed by adjusting the size of the orifice through which the oil flows, i.e., by regulating the valve, 16. The friction band, 17, having a fixed fulcrum at 18 may be used to further regulate the speed. In applying the device as a clutch or speed-changer the shaft, 11, is the driver and the shaft, 19, the driven, and if the shaft, 11, with its driving-wheel, 13, be rotating at the speed of the engine and the shaft, 19, be at rest, by restricting the flow of oil the case is made to rotate at a gradually increasing speed, and with it the second shaft, 19, rotate at almost the same speed as the first shaft. The valve, 16, is controlled by a lever, 20, fulcrumed on a swinging bracket, 21, on the shaft, 19, operating a sliding sleeve, 22, which in its turn moves the lever, 23, which causes the valve, 16, to be raised or lowered from its seat, and so governs the amount of oil which can circulate. May 4th, 1905.

Patent Specifications Published.

Applied for in 1904.

Published June 1st, 1905.

- 2,711. L. M. LE PAGE. Intl combn. engines.
- 10,239. A. J. BARKER AND C. WESTWOOD. Motor cycle flexible drive and power transmitter.
- 10,286. C. J. MEGEVET. Radiators.
- 10,711. A. FROME. Agricultural motor vehicle.
- 10,719. J. MEES. Hot-air, steam, and combustion product engines.
- 11,342. F. HUMPHRIS. Carburettors.
- 12,219. T. HAMILTON-ADAMS AND H. S. SOUTAR. Variable speed-gear.

The Automotor Journal, June 3rd, 1905.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

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JUNE 3RD, 1905.

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Photo by Baker and Dixon.

GORDON-BENNETT ELIMINATING TRIALS.—Mr. Clifford Earp, who has secured premier position in the Isle of Man Trials, taking the famous "Hairpin corner" on his 80-h.p. Napier Car.

THE AUTOMOTOR JOURNAL.

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NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C., by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

1905.		
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.).	
June 10 ...	London-Edinburgh (Motor Cycling Club).	
June 12 ...	Filey Sands Races (Yorkshire A.C.).	
June 14 ...	Bexhill Race Meeting.	
June 24 ...	100 Miles Passenger Trial (Motor Cycling Club).	
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).	
July 8 ...	Auto Cycle Club Consumption Trial.	
July 12 ...	*Hill-Climb (Henry Edmunds Trophy).	
July 19-22 ...	*Brighton Speed Races.	
July 27-28-29 ...	*Blackpool Motor Meeting.	
July ...	24 Hours Run (Motor Cycling Club).	
Aug. 2-3 ...	*Motor Boat Trials (Southampton).	
Aug. 11 or 18 ...	*Quarterly 100 Miles Trials.	
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.	
Aug. 26 ...	Inter-Team Trial (Motor Cycling Club).	
Sept. 9 ...	Brown Cup (Motor Cycling Club).	
Sept. 12 ...	Auto Cycle Club Race Meeting.	
Sept. 14 ...	*Tourist Trophy (Isle of Man).	
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).	
Sept. 20, Oct. 24 ...	*Van Trials.	
Oct. 4 ...	*Speed Trials.	
Nov. 10 or 17 ...	*Quarterly 100 Miles Trials.	
Nov. 17-25 ...	Society of Motor Manufacturers and Traders Exhibition at Olympia.	

Foreign Events (Trials, Races, &c.).

1905.		
June 16 ...	French Selection Race for G.B.	
June 25 ...	International Motor Cycle Cup.	
June 20-28 ...	Aix-les-Bains Week.	
July 1 ...	Boulogne-Cape Gris-Nez (Motor Boats).	
July 5 ...	Gordon-Bennett Race.	
July 9-22 ...	Ostende Automobile Meeting.	
July 11 ...	Start for Glidden Trophy (New York).	
July 15 ...	Boulogne-Folkestone (Motor Boats).	
July 16 ...	Mont Cenis Hill Climb.	
July 20-26 ...	Paris to the Sea (Journal de L'Automobile).	
July 28-Aug. 8 ...	Paris Industrial Vehicles Trials (A.C. France).	
July 27 ...	Gaston Menier Cup (Motor Boats).	
July 31 ...	Anthony Drexel Cup (Motor Boats).	

* Automobile Club of Great Britain and Ireland Events and Papers.

Aug. 6-7 ...	Circuit des Ardennes.
Aug. 10-16 ...	Herkomer and Bleichroder Races.
Aug. 12 ...	International Cup for Motor Boats.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Tri-Car Competition (L'Auto).
Sept. ...	Vincenzo-Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.
Sept. ...	Tourist Car Trial (A. C. de France).
Sept. 3-10 ...	Royan Meeting.
Sept. 3-10 ...	Spa Automobile Club.
Sept. 11 ...	British International Cup (Motor Boats Arcachon).
Sept. 12-14 ...	Lake Lucerne Motor Boat Meeting.
Oct. ...	Vanderbilt Cup.
Oct. 1 ...	Chateau Thierry Hill Climb.
Oct. 15 ...	Gaillon Hill Climb.

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AIX-LA-CHAPELLE, J. A. Mayer, Eisenbrunnen.	PARIS OFFICE, F. Tennant Pain, 8 Rue Favart; Galignani's Library, 224 Rue de Rivoli; Librairie Timotie, 14 Rue Castiglione; Librairie Byron, 8 Rue Castiglione; Librairie Shakespear, Avenue des Champs Elysees; Librairie Celtic, Rue Marboeuf; Librairie Anglaise, Avenue Victor Hugo, the Kiosques at the Nord, Lyons (P. L. M.), and St. Lazare Termini; and at the principal Kiosques on the Boulevards.
AIX-LES-BAINS, A. Gerente, 32 Rue de Geneve, and F. Mabboux, Place du Revard.	
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BERNE, Schmid & Francke.	
CARLSBAD, Hoffmann & Epstein, Alte Wiese.	ROTTERDAM, Nederlandsche Kiosken Mijp, Wynhaven 85.

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PASSING EVENTS.

The Scottish Reliability Trials.

THE Scottish Automobile Club are to be heartily congratulated, both on the successful manner in which they have carried out the very elaborate series of reliability trials (of which the results have just been issued), and on the satisfactory way in which the cars which submitted themselves to that ordeal have gone through the test. The Trial was an exceptionally arduous one, owing to the extremely hilly character of the roads over which it has taken place, and this fact gives a quite exceptional significance to the large number of really remarkable performances which have been chronicled. This is a matter of congratulation for the competitors; but the organisers of the event—the Scottish Automobile Club—are to be at least equally congratulated, not merely on the admirable arrangements which enabled everything to run through without a hitch, but also on having with very special care conducted a number of subsidiary tests. The rules under which the competition has been held were given in detail by us in our issue of March 4th last, and were, in their main features, practically identical with those that have been adopted by the Automobile Club for similar trials in England.

The subsidiary detailed tests to which we refer, and which were taken throughout the Trial, have been specially directed to ascertaining the fuel consumption with very particular care, and a table has been got out enabling the general relationship of car weight to the amount of petrol used to be readily noted. What may almost be called tyre consumption has also been taken cognisance of. Of course, luck plays a very large part in influencing the behaviour of these indispensable equipments of every car. But still it is probable that, from the data obtained, certain general conclusions in regard to the proper ratio of the size of tyres to the weights they have to carry may be arrived at, and for this reason we reproduce these results, as also those relating to the fuel consumption tests, fully in our table.

The total result of the careful tests and trials made is to afford most important and useful data in regard to modern car consumption and tyre wear and tear under exceptionally trying hill difficulties, and from this point of view, if from no other, the events form both a record in a special class of competition, and a source of useful information. That the gold medals in each of the three classes were won by entirely British-built cars is a fact of which home manufacturers may well feel proud!

An agreeable feature of the meeting has, as in the case of the outing of the Motor Union at Nottingham and Welbeck (which we chronicled last week), been the extremely cordial, good-natured, hearty, and considerate co-operation of the police, who have done everything in their power to facilitate the holding of the trials, to assist the official organisers and to make things easy for the competitors. It must be admitted, as a general experience, that where important trials have been held at any point in the United Kingdom, the police now usually afford very cordial co-operation, and it is perhaps one of the by no means less important aspects of such competitions and events that they tend to promote the best of feeling between the police force concerned and automobilists generally. The force comes to learn that responsible automobilists are on the

whole excellent people, and the automobilists have an opportunity of recognising that a policeman, when left to himself and not hampered by superior instructions, is usually a cordial admirer. When this impression has been once established, it is only the fault of individuals if the good feeling is subsequently impaired.

Wouldn't They Like It!

“WILL the Right Honourable gentleman consider the propriety of allowing local authorities to settle these matters for themselves?” Such was the question recently put in the House of Commons by Mr. Bowles (of general celebrity) to the President of the Local Government Board. It is an artfully devised question, for the employment of that “blessed word” propriety more than begs half of the very question which is being put. There would be no propriety about it at all; on the contrary the greatest impropriety. Local authorities, whether county councils, district councils, or parish councils, do not *own* the roads which pass through their districts. The roads are for their use, and for the use of their parishioners and constituents, it is true, but they are just as much for the use of the United Kingdom, and for any foreigners who, in accordance with the law of nations, find it convenient to sojourn in our midst. The citizens of London and Edinburgh have as much right to use the roads running through Little Mudmire as the squire and parson of that classic hamlet themselves. The eye of the prophet is not required to foresee what would happen if all the local councils were allowed to decide, without the supervision of some higher tribunal (having the interests of the State as a whole at heart), what the speed of vehicles should be on the roads over which, by some inscrutable dispensation, they exercise a far from beneficent sway. The influential members of most of these bodies are unfortunately but too seldom persons of much enlightenment or width of view. The hills that bound the prospect from the village church are often synonymous, not merely with their physical, but with their intellectual horizon. It is a poetical position possibly, but not a practical one. People of this calibre may be admirable fellows in their own sphere, but to remain admirable they must keep within it. The old proverb about the shoemaker and his last remains as true as ever. Were they given the powers Mr. Bowles suggests, there is but too much reason to fear they would go a long way towards putting an end to the automobile movement, just as similar influences made an end of the old steam car movement before the days of railways. The tendency of modern progress and modern legislation is all the other way. It is being recognised more and more that the roads are the property of the community, and one of its most valuable properties, too. Never again will local quidnuncs be allowed to paralyse locomotion on the roads through their districts. On the contrary, the tendency is all for centralisation of highway authority and highway control, and the delegation of merely subsidiary powers to local bodies. Such being the case, it is simply unblushing reaction to suggest that they should have the powers Mr. Bowles proposed to confer upon them. In fact, such a proposal would never have been put forward except as an appeal to anti-motorist prejudice, from which point of view the suggestion is ominous enough. Automobilists, both in and out of Parliament, cannot too strenuously concentrate all their efforts to combating it.

Attack by Discrimination.

BOTH above and on other occasions have we drawn the attention of our readers to the principal manoeuvre by which the old steam car industry was crushed and worried out of existence—the infliction of prohibitive tolls at turnpikes and bridges. It was an admirable method of accomplishing its contemptible end. It avoided the odium of legislative interference. There was no apparent restriction of the rights of the individual or of the manufacturer. There were specious grounds alleged (increased road destruction, &c.) for their imposition, and above all the method was effective—for it killed the victim. Slow poison is just as effective as the dagger, when the victim can be compelled to swallow it, and high tolls slowly poisoned steam road car enterprise. It is interesting to discover that the same old contemptible spirit not only survives but is actually still at work. In the neighbourhood of Littlehampton, there is a ford over the Arun, and the Littlehampton Town Council are now promoting a Bill to obtain powers to replace or supplement the ferry by a bridge, and to charge tolls for “all goods, wares, and merchandise, matters or things” carried across it. The Council calmly propose to discriminate against mechanically driven vehicles by imposing a toll of 6d. per cwt. where the “goods, wares, merchandise, matters or things” are conveyed across the bridge “not in any carriage drawn by any horse or other beast.” Needless to say, this is a practically prohibitive charge, and amounts to nothing more nor less than an octroi duty of a special kind, designed to cripple, and as far as possible prevent, automobile road transport of goods over the bridge. If the Council had chosen to limit the weight which might be carried in any particular van, car, or trolley, that would have been another matter, but it would seem that they are “out to kill.” It is not a case of a legitimate attempt at obtaining a revenue, for, under such conditions, traffic will certainly go round, or by rail. It is a bad sample of the bad old spirit of former days, which one had fondly hoped was becoming extinct.

Such contemptible methods should be met on their own ground. It is true that the Bill has not yet passed through Parliament. It has been passed by the Lords, and is now coming before the Commons. When it arrives there, we think this provision ought to be strenuously opposed as a matter of principle by all the automobilist members of the House. It is an exceptional provision that nothing can justify. It is aimed against the automobile movement, and it ought to be stopped.

A Chance for Assinus Communis.

But should prejudice prevail, and the Bill ultimately become law, with this provision, we look forward to seeing some amusing developments. If a horse, or even a donkey, assists in the propulsion, say, of a motor lorry, it is quite impossible to decide how much of the total load he is actually drawing. Such a vehicle, at any rate with horse or donkey assistance, would not come under the definition of “not being in any carriage drawn by any horse or other beast.” So perhaps we shall see a new industry grow up in the neighbourhood of Littlehampton, and the proprietors of elderly horses and donkeys, which need not necessarily be very robust, letting them out to assist in propelling the “goods, wares, merchandise matters, and other things” across the prospective Arun bridge. This would be a proper method of checkmating the reactionary Town Council.

It would, so far as we can see, be quite legal, and it would have the additional advantage of making everybody laugh at the reactionaries.



The Marquis and the Magistrate.

THE most trenchant drama owes much of its success (according to the critics) to the judgment with which comic, or at any rate humorous relief is provided at trying moments. The drama of the automobile movement is proving no exception to this rule. The situation in regard to the continued depredations of the reckless driver, and the refusal of the hooligan and road hog to be suppressed, is becoming serious, not to say critical. There are rumblings and grumbings in Parliament, rage outside it, and threats of terrible things to happen in the near future. So the Gods in their great mercy have provided the Marquis of Queensberry to make everybody smile at a moment when if they did not smile they might become tragic. The Marquis is going one better than Sir Ralph Payne Gallwey. This latter potentate, as will be remembered, proposed only to chastise motorists with buckshot. The noble Marquis suggests a revolver and a bullet, and he manoeuvred with great adroitness so as to obtain, if possible, the countenance of a London magistrate to his suggestion. We are not sure that the proposed change would be to the disadvantage of the automobilist, or to the advantage of the general public. Though the former would be more seriously injured *if* hit, there is a much greater probability of his being missed altogether, and the bullets finding their billets in some unintended victims.

These remarks, needless to say, are suggested by the story of the comic appearance of the noble Marquis before Mr. Lane at the West London Police Court. Lord Queensberry explained to the magistrate that living as he did in Edith Villas, on one side of the Hammer-smith Road, he had on several occasions during the last ten days only escaped death from the rampant motorist by a miracle and half an inch, while the nerves of the nurse of the children of the Marquis (this is not a sentence from Ohlendorff, though it might be) have been so deranged that she flatly refuses to convoy her charges across the roadway, and this service of danger is thrust by a sad fate, and the road-hooligan, upon the noble Marquis himself. He added suggestions to the effect that motorists who drove recklessly should be shot in the same way as men running amok in India or Africa, and wound up by asking the learned magistrate whether he might carry a “gun.” The magistrate observed that if he *could get a licence*, the Marquis was at liberty to carry a pistol, but after his declared intentions there is a probability that the Marquis, if he does not already possess such a licence, will find a difficulty in obtaining one.

It is all very funny, no doubt, and we believe the noble Marquis intended it to be so, for in a subsequent interview he has declared that he is not an anti-motorist, but, on the contrary, an ardent automobilist himself. It is the lack of consideration for others on the part of the reckless driver and the injury he is doing, not only to the amenities of life generally, but to the future industry and the trade, that has caused Lord Queensberry to take this particular line to do what in him lies to draw special attention to the nuisance, and assist in putting an end to it. In that, the Marquis has our fullest sympathy, though we are not sure that his method is to be commended. At best, it savours strongly of exag-

geration, and to many it may appear that an unnecessary amount of comedy has been mixed (intentionally or not) with what is after all a very serious subject for everybody concerned. It is serious for ordinary road users. It is even more serious for automobilists and the automobile industry, but we hope that it will very soon be made most serious of all for the reckless, inconsiderate, ill-conditioned, ill-bred, and usually ill-educated semi-lunatics who are the cause of all the trouble and annoyance.



A Better Way.

THIS question of the suppression of reckless driving is so tremendously important from every point of view that we hail with thanks assistance from every source, even where we are not altogether in sympathy with the tone in which it is tendered, as in the case to which we have referred above. A much better way of dealing with the difficulty than by making serio-comic proposals to magistrates is that which has been very generously proposed by Mr. Paris Singer. Mr. Singer, as one of the leading members of the Automobile Club, one of the pioneers of a particular branch of automobilism in this country, and himself a most enthusiastic votary of the pastime in all its forms, recognises with special force the extreme danger to the future of the most important movement which we have seen since the introduction of steam, which is being caused by a class of driver to whose character and proceedings we have been compelled on many occasions (as above) reluctantly to refer. Mr. Singer is devoting £1,000 a year to a fund for rewarding informers to the amount of £100 in each individual instance who succeed in identifying that most rascally of all misdemeanants, the man who in a motor vehicle occasions an accident, and after causing it takes refuge in flight. It would be perhaps as well should Mr. Paris Singer's munificent offer be made the nucleus of a larger fund for the purpose he has in view, and which perhaps might advisably be still further extended to cases of ordinary reckless driving, where the offenders have escaped.

Needless to say Mr. Singer's action must be looked upon entirely as supplementary and additional to the methods which, on previous occasions, we have drawn attention to and advocated. We refer, of course, to the organised action of the Automobile Club and the Motor Union, and the Considerate Driving League. With all these forces acting in conjunction, we may look forward with hope, either to the improvement and education of the road hooligan into a bearable member of society, or to things being made so extremely unpleasant for him that he will either refrain from automobilism altogether or select some other country as the scene of his excesses and depredations.



Roseate Prospects.

TRAVELLERS and tourists through London are commencing to have an opportunity of enjoying the first-fruits of the proposed colossal expenditure by the County Council in the dislocation of street traffic along some of our principal highways. With special appositeness, therefore, come the publication of certain provisional statistics dealing with the motor 'bus traffic and the results of working on the few motor 'bus lines which have been already established in the Metropolis. From these figures it would appear that the commercial future of the motor 'bus is likely to prove more successful and lucrative than even its promoters had anticipated. This at any

rate is the conclusion to be drawn from what appears to be the greatly superior earning power of the motor 'bus as compared with its horse-drawn competitors. Taking average figures, it would appear that a good average day with a horsed 'bus may be counted on to bring in £2. £2 5s. is looked upon as excellent, and £2 10s. exceptionally good. Contrast these figures with the earnings of the motor 'bus. With them a good day means £10, and even as much as £12 per day—under exceptionally favourable circumstances, it is true—has been taken. These results are to be attributed partly of course to their greater seating capacity. The second important contributing cause is the greater speed with which they get through their journeys. This of course depends in general more upon the state of traffic on their lines of route than on their own exertions and capabilities, but the number of journeys in a working day that a motor 'bus will make on a good route, partly owing to its superior speed, and almost more owing to its superior manoeuvrability, and rapid acceleration, is very considerably greater than a horsed 'bus can accomplish. The third cause of their superior earnings is undoubtedly their greater popularity.

Of these three grounds of success, the two first may practically be looked upon as permanent assets. The third may possibly suffer some diminution as the automobilisation of 'buses becomes general and ultimately universal. This conclusion does not however follow. It is at least as probable that the effect will be to increase, at any rate very largely, the numbers of travellers by 'bus who, with the increase in motor 'bus accommodation, will have less and less reason for adopting other means of locomotion.

Even without assuming, however, that the present superiority of the motor 'bus as a revenue-earning appliance will be maintained in its entirety, the figures now provisionally obtained upon what are after all to a large extent chiefly experimental lines, are more than encouraging, they are almost phenomenal. They provide a caustic commentary, too, on the amazing haste which has been displayed by our municipal authorities in rushing into their enormous electric tram extension. The whirligig of time will probably bring its revenges. There can be little doubt that the successful competition of the motor 'bus will heavily discount the revenue earning capabilities of the electric tram.



The Daily Paper Peril.—Last week the daily papers chronicled a shocking instance of reckless automobilist brutality, motor car hooliganism, road hoggishness, and all the rest of it. The victim of a motor car accident (it was alleged) was found lying in the road near Llwyn-Hilog in an unconscious condition. When he was restored to a condition of more or less normal cerebration he declared that he had been run over by a motor car. He has since then been examined by a doctor, who stoutly maintains that there is no evidence of any such collision upon the person of the labourer, and after being pressed on the subject he is not quite sure whether it was a motor car, a horse-drawn vehicle, or something that he "fell up agin." In the meantime no doubt the accounts of the shocking outrage have done their work. Even if inserted, the contradictions of the original "invention" put forward would not overtake the original lie, and it is probable that few contradictions will be made. The old advice for injuring the opposite party (politically) still holds good, "Get a good lie and give it a good start."

BRITISH-BUILT MOTOR CABS FOR LONDON.

THE cabs which a private company, the London Motor Cab Company, are now placing on the streets in London, are of a type which was very fully described by us in November and December last. The Rational petrol chassis is—as we then said—a good, honest, solid piece of workmanship that may perhaps be best described as a characteristically English production, and the Heatly-Gresham Engineering Company are to be congratulated



upon having introduced a model which can not only be turned out at a comparatively low price, and requires no special skill in manipulation, but should prove a good commercial investment for regular service work of this kind. The mechanism is simple and substantial, the parts are readily accessible, besides being interchangeable, the power is normally transmitted direct from the crankshaft to the back axle by a single chain, and, therefore, the cost of up-keep should be low.

It has only been necessary to very slightly modify the makers' standard chassis to render it suitable for cab work, and the fact that a horizontal engine is employed has enabled almost the entire length to be made use of for the body, the result being that the new cabs have no bonnet, and the driver's seat is situated above the engine and its gearing. Our illustrations give an excellent idea of the neat appearance of these vehicles, the bodies of which are extremely comfortable and roomy. They combine, to a great extent, the advantages of a brougham with those of an ordinary hansom, for the doors are fitted at an angle, and there is seating accommodation inside for a third passenger. From the main seat—which is wider than that of most hansoms—a good view is obtained ahead, as well as through the large side windows, while the second seat, with its back to the driver, is hinged so that it folds down out of the way. By fitting the doors at an angle, other advantages are also obtained, for not only can they be made

wider, but they render a large platform available for luggage, on each side of the driver's seat in front. The petrol tank lies beneath the driver's seat, above which projects the roof—to afford protection—and there is a very large tool-box at the back of the cab.

It will be remembered that the horizontal engine has two forwardly projecting cylinders of 110 mm. bore and 120 mm. stroke, and that it runs at a comparatively low speed, though capable of developing about 12 b.h.p. Its heavy flywheel is placed centrally in the frame, between the crank-chamber and the gear-box, the main shaft passing across transversely, and having the high-speed clutch on its extreme end. One low-speed and a "reverse" gear are provided, and these are of a special epicyclic type contained inside the gear-box, but these mechanisms normally revolve as one solid piece with the main shaft. They are, moreover, introduced by the application of brake-bands, so that the change-speed mechanism is of a type that is often termed "fool proof." The change-speed lever acts in conjunction with the clutch pedal, and is fixed to the steering pillar, alongside the small engine-controlling levers. In the way of brakes, ample control is ensured by a foot-operated brake on the driving sprocket, and by the hand-brake that acts on the two driving wheels.

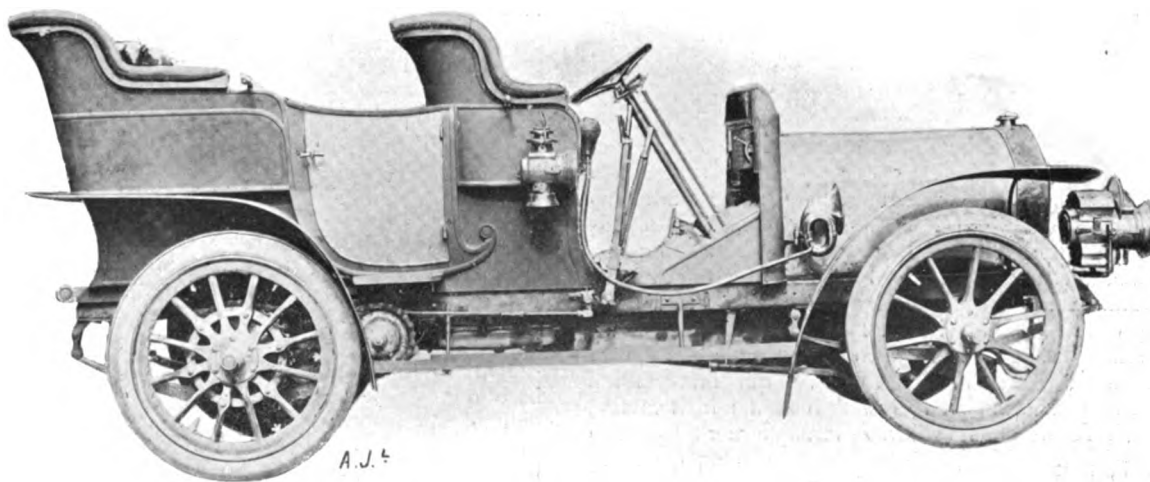
These motor cabs are geared to run at any speed up to about 18 miles per hour, and have proved themselves to be excellent hill-



climbers. Under ordinary circumstances, in traffic, no use is made of the low gear, since the vehicle can be started from rest without shock on the high gear, and the engine has ample power for the work that it has to perform. On the other hand, however, the low gear enables the cab to ascend such gradients as that of Netherhall Gardens.

From our own experience with one of the new cabs, we can speak as to their remarkable handiness in traffic, freedom from vibration, and all-round comfort.

THE LEGROS AND KNOWLES PETROL TOURING CAR.—PART IV.



Side View of the 24-h.p. Legros and Knowles Petrol Car.

The Clutch.

THE construction of the inner member of the clutch is clearly shown in Fig. 15, and its arrangement in con-

rock-shaft. It will be noticed that by taking out these two fulcrum-pins, and removing one of the pins from the universal joint, the entire inner member of the clutch can be lifted out.

The clutch-spring, F^8 , which normally holds the clutch in engagement, is fitted as seen in Fig. 3 between the rock-shaft and the main frame. Being stationary, it is always very accessible for adjustment. The thrust imposed by it on the clutch is taken by a ball-bearing that lies between the fly-wheel and the crank-chamber.



Fig. 11.—One of the Legros and Knowles Inlet-Valves, shown complete and in parts.

junction with the clutch-pedal, F , in Fig. 14. The aluminium clutch-cone, F^1 , rides freely on the end of the crank-shaft, and is connected with the change-speed-gear by the shaft, F^2 (Fig. 3), which has universal joints at both ends. The clutch-cone, F^1 , which is a leather-faced aluminium casting, is made in a separate piece from its central boss, and, instead of being rigidly fixed to the boss, is carried upon two projecting pins, F^3 , that render it free to slide longitudinally over the boss. The clutch-cone is connected by a bridge-bracket, F^4 , with the collar, F^5 , and this collar has a ball-thrust bearing between it and the thrust-ring, F^6 . The thrust-ring, F^6 , is connected with the clutch-pedal, F , through the forging, F^7 , to which are hinged two projecting arms from the pedal-

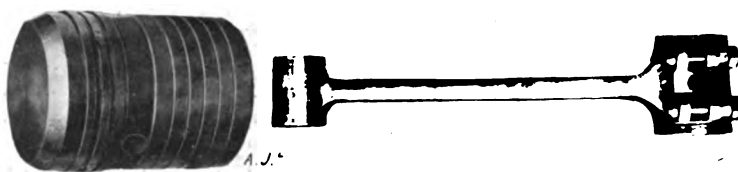


Fig. 12.—One of the Pistons and one of the Connecting-Rods, used in the Legros and Knowles Engine.

The Change-Speed-Gear.

The construction of the gear-box is best shown in Fig. 16, which is a view from *beneath* with the base casting removed. This photograph demonstrates the remarkable accessibility of all the parts from the under-side of the car, and shows how easy it is to adjust a bearing, or to replace a part, without



Fig. 13.—The Legros and Knowles Circulating Pump, shown in parts and complete.

disturbing the body or any other part of the mechanism. In Fig. 14 and in Fig. 2, the upper portion of the gear-box is seen in the chassis, and there the large detachable cover that comes immediately over the "reverse" gear-wheels and their intermediate shaft is prominent. At its rear-end, the gear-box is held to the frame by two bolts, and at the front end the single bolt, G, is hinged to it in such a way as to prevent any strains being imposed by any twisting of the frame. The box is rendered somewhat larger than usual owing to the fact that the three sliding rods, G¹, that operate the gear are completely enclosed in it.

In general design, it will be noticed that Mercedes lines have been followed, and that there are two independent sliding members mounted upon the first-motion-shaft, G¹. The 1st and 2nd speed spur-wheels are controlled by the central rod, G¹, and the 3rd and 4th wheels by the outer rod, G¹, while both sliding members ride on three feather-keys, which are formed solid with the nickel-steel shaft. The second-motion-shaft, G²—to

wheels, G³, for the "reverse" gear are carried on the shaft, G³, in the top of the gear-box, in such a way that they can be brought into engagement with the 2nd speed wheel on the shaft, G¹, and the 1st speed-wheel on the shaft, G². These intermediate wheels are controlled by the inner sliding rod, G¹, through a pivoted, and forked, striking-lever.

The three sliding-rods, G¹, terminate at their front ends in square guide blocks, about which is fitted the safety cage, G³. This cage is so arranged that it only allows one of the rods, G¹, to be moved at a time, and locks the other two to the casing. The cage is connected with the sleeve to which the gear-lever is fixed, and there is—also secured to this same sleeve—a toothed quadrant which engages with corresponding teeth on the upper sides of the rods, G¹. As the gear-lever is moved sideways, when in its neutral position, it is consecutively brought into engagement with each of the three rods, G¹, and it simultaneously compels the cage, G³, to lock the other two rods. When the gear-lever is moved out-

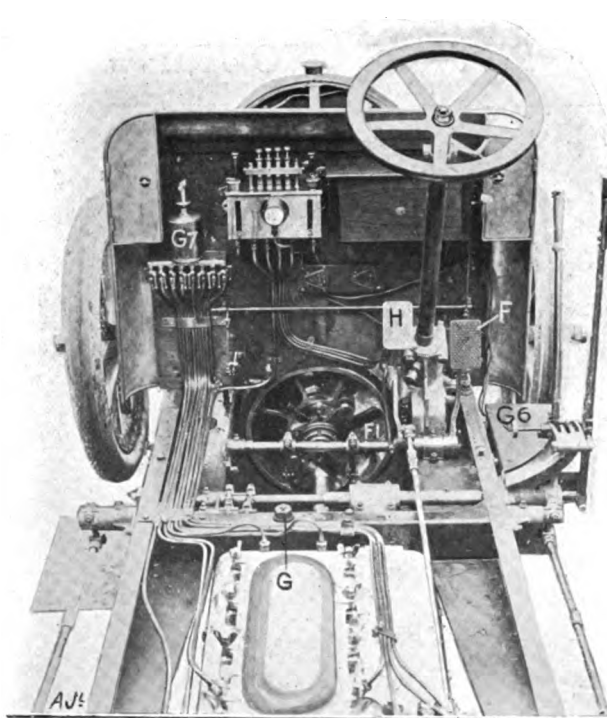


Fig. 14.—The central portion of the 24-h.p. Legros and Knowles Chassis, showing the arrangement of the regulating levers and pedals, as well as the fittings on the dashboard.

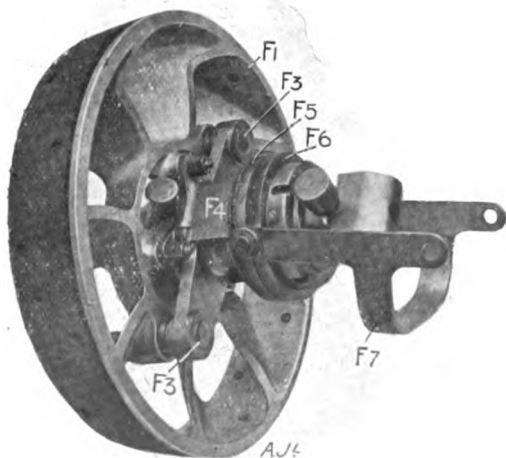


Fig. 15.—View of the "driven" member of the Legros and Knowles Clutch.

which are fixed the four spur-wheels and the bevel-pinion that drives the large bevel-wheel on the differential—has a plain thrust-bearing at its rear end, and is, like the other shafts, mounted in long plain bearings. Behind the bevel-wheel on the differential countershaft is a ball thrust-bearing, and outside the gear-box, on the right side, is the brake-drum, H¹. The intermediate spur-

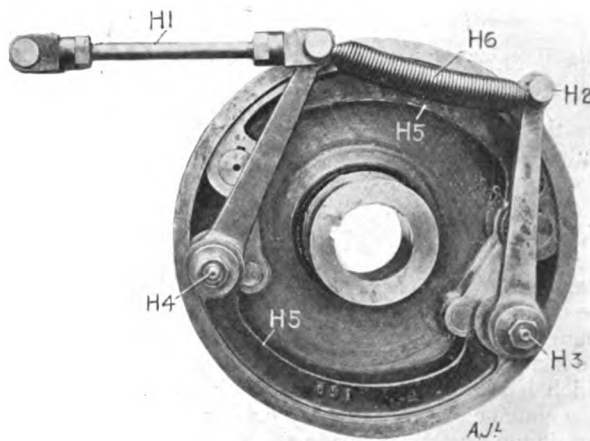


Fig. 17.—One of the Brakes, used on the Legros and Knowles Car.

ward as far as it will go, it can then be made to give the 3rd speed by being pressed forward in that notch, and to give the 4th speed by being drawn backwards in it. In the central notch, the 1st speed is brought into play by moving the lever forwards, and the 2nd speed by drawing it backwards, while the innermost notch permits the "reverse" gear to be introduced, when

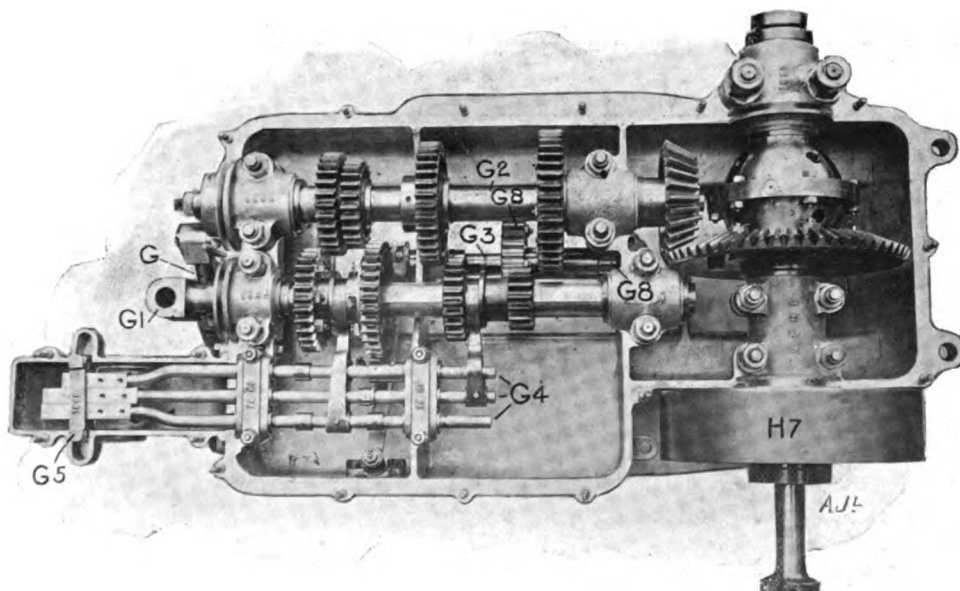


Fig. 16.—The Legros and Knowles Gear-Box, as seen from the underside, with the base removed.

the lever is pulled towards the driver. The usual safety catch prevents the lever from sliding into the "reverse" notch until the small push-button at the top of the lever has been depressed, and the special locking pin, G^6 , is fitted to the quadrant in such a way that, when the pin is slid into position, the lever can be moved sideways only, and neither of the speeds can be introduced.

The entire gear-mechanism runs in an oil bath, but it will be noticed (see Fig. 14) that a separate pipe is led to each bearing from the greaser, G^1 , on the dashboard. Each pipe has a control cock forming a part of the lubricator-fitting, so that the grease can be forced to whichever bearing is desired. Two of the pipes are led to those bearings that support the ends of the countershaft and are secured to the side members of the frame; it will be understood that the usual jaw couplings are introduced in each half of the countershaft.

The Brakes.

The brake on the countershaft which is operated by the foot-pedal, H , and the brakes on the rear hubs, which are brought into operation by the side-lever, are all three designed in precisely the same way. One of them is shown in Fig. 17, and from this illustration their construction will be readily understood. The two shoes, H^5 , which lie inside the brake-drum, are connected together by a system of links, which enables both shoes to be simultaneously forced outwards when either of the pins, H^3 or H^4 , is rocked about its axis. Both these pins are fitted with external levers, the one of which is

anchored to the main frame by the adjustable link, H^1 , and the other is connected to the operating lever or pedal by the bolt, H^2 . The pin, H^4 , is rigidly secured to the axle or to the frame, as the case may be, and the pin, H^3 , is connected with the axle (or the frame) by a spring that tends to hold it upwards. This spring merely prevents the lower shoe, H^5 , from rubbing against the drum when the brake is "off," but the brake is actually held "off" by the large spring, H^6 . A special point about this brake is that it can be adjusted either by the anchor-rod, H^1 , or by lengthening or shortening the operating rod. The adjustment range

that is available has been still further increased by placing the keys that hold the external levers to the pins, H^3 and H^4 , in such positions that these levers can ultimately be taken off, turned round, and replaced hind-before, to give a further lease of life to the brake shoes.

Table of Reference Letters for the Legros and Knowles Car Illustrations.

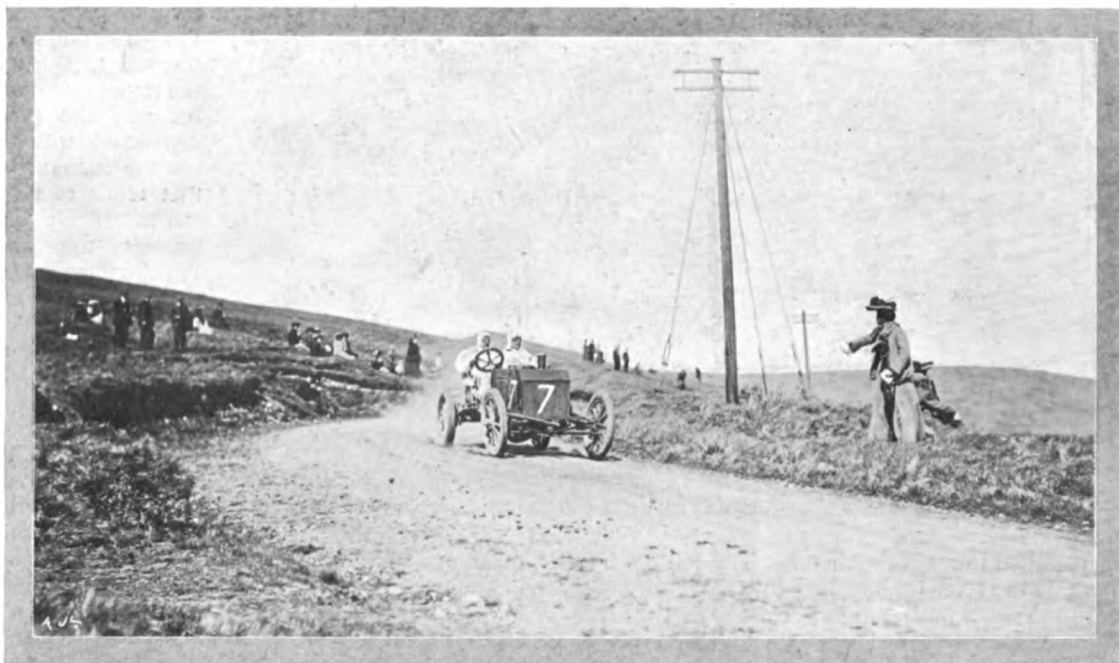
A^1 } Side members of main frame.	D^2 Inspection-doors.
A^2 } Expansion chamber for exhaust-gases.	D^3 Grooves receiving base casting.
A^4 Exhaust-box.	E Small shafts for engine lubricator.
A^5 Screw thread on steering-pillar.	F Clutch-pedal.
A^6 Nut for same.	F^1 Clutch-cone.
A^7 Rock-shaft carrying steering-arm.	F^2 Shaft between clutch and gear.
A^8 Connecting link between A^6 and A^7 .	F^3 Pins carrying clutch-cone.
A^9 Rod for engine-controlling hand lever.	F^4 Brackets connecting F^1 with F^3 .
B Induction-pipe-fitting.	F^5 Ball thrust-collar.
B^1 Induction-pipe.	F^6 Operating thrust-ring.
B^2 Exhaust-valve inspection-covers.	F^7 Forging connecting F^6 with rock-shaft.
B^3 Inlet-valve seat-castings.	F^8 Clutch-spring.
B^4 Cover-castings for B^3 .	G Hinged bolt for gear-box suspension.
B^5 Pivoted levers operating inlet-valves.	G^1 First-motion-shaft.
B^6 Brackets carrying fulcrum-shaft for B^5 .	G^2 Second-motion-shaft.
C Low-tension igniters.	G^3 Intermediate "reverse" shaft.
C^1 Push rods for inlet-valves.	G^4 Sliding operating rods.
C^2 High-tension ignition-plugs.	G^5 Locking cage.
C^3 Commutator.	G^6 Locking pin for gear-lever.
C^4 Low-tension magneto.	G^7 Grease lubricator.
C^5 Low-tension "timing" rod.	G^8 Intermediate spur-wheels.
D Casting carrying valve-operating cam-shaft.	H Brake-pedal.
D^1 Castings carrying ignition cam-shaft.	H^1 Adjustable anchor-bolts for brake-shoes.
	H^2 Connection pin for operating-rod.
	H^3 Spring-suspended fulcrum pin.
	H^4 Fixed fulcrum pin.
	H^5 Brake-shoes.
	H^6 Brake-spring.
	H^7 Brake-drum on countershaft.

In Honour of King Alfonso of Spain.—The original announcement of holding speed tests over the kilom., in the Bois de Boulogne, Paris, for the edification of King Alfonso, on Friday of this week, had to be modified owing to the number of engagements which the King was compelled to honour. The programme was, therefore, shortened by allowing several of the cars taking part in the Gordon-Bennett Eliminating Trials to race past the King at top speed, whilst the Corso Fleuri, which originally formed part of the programme, was carried out in its entirety.

THE Isle of Wight Express Motor Syndicate are offering special prizes to their drivers for avoiding accidents or serious complaint from the public.

SPEAKING portraits of Sir John I. Thornycroft and Mr. Alfred Bird, the chairman of the Races Committee of the A.C.G.B.I., are in this year's Royal Academy. Both are splendid works of art, the former by Mr. Arthur T. Nowell, and the latter by Mr. J. Seymour Lucas, R.A.

THE ISLE OF MAN ELIMINATING TRIALS.



ISLE OF MAN ELIMINATING TRIALS.—First British representative, Mr. Clifford Earp, on his Napier (No. 7), taking a nasty bend at Snaefell.

Douglas, May 29th.

ONE of the things that may be urged in favour of holding the Gordon-Bennett Cup Eliminating Trials in the Isle of Man is undoubtedly the piquant contrast which is provided.

On the one hand we have the ultra-modern—on the other, suggestions of former days, of the Middle Ages, almost of Viking times, in the ancient ceremonies and customs of the independent island. Chief amongst these sugges-

TABULATED RESULTS OF THE ELIMINATING TRIALS FOR GORDON-BENNETT RACE.

No.	Car.	Driver.	Gross Time for each Lap.												Average Time per Lap.	
			1st.	2nd.	3rd.	4th.	5th.	6th.								
			h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.			
1	70-h.p. Star ...	H. G. Goodwin	1 31	01 30	30 1 31	01 24	43	A	—	—	—	1 29	18½*			* At completion of 1st lap some 12m. occupied in attending to spring shackle, which had become reversed, and in fixing loose guard beneath engine.
2	70-h.p. Star ...	F. R. Goodwin	1 53	01 56	01 38	30	B	—	—	—	—	1 49	10			† Had trouble with ignition apparatus and with brakes.
3	90-h.p. Darracq	A. L. Guinness...	1 19	0	C	—	—	—	—	—	—	1 19	0			‡ Delayed by brakes on 2nd lap, and tyre troubles on 3rd.
4	90-h.p. Wolseley	C. Bianchi	... 1 20	01 14	30 1 28	45 1 15	30 1 14	30 1 25	01 19	42½						§ During 1st lap had some trouble with gear-lever.
6	80-h.p. Napier ...	C. Edge...	... 1 16	02 11	30 2 45	01 26	30	D	—	—	—	1 54	45†			|| During 1st lap auxiliary spokes suffered through charging a bank to avoid a dog, and subsequently ignition troubles also experienced
7	80-h.p. Napier ...	C. Earp...	... 1 24	01 8	30 1 33	30 1 11	14 15 1	21 30 1	18	47½						¶ During 1st lap about 14m. delay replacing pump-chain, and during 2nd, ignition and gear troubles experienced.
9	80-h.p. Napier ...	J. Hargreaves	... 1 37	01 22	45 2 49	01 34	0	E	—	—	—	1 50	41½‡			
10	100-h.p. Siddeley	S. Girling	... 1 24	0	F	—	—	—	—	—	—	1 24	08			
11	90-h.p. Wolseley	C. S. Rolls	... 1 24	01 31	01 17	30 1 35	30 1 26	30	G	—	—	1 26	54||			
12	90-h.p. Napier ...	A. E. Macdonald	1 35	30 3 5	0	H	—	—	—	—	—	2 20	15¶			

A—Only reached Ramsey at expiration of time limit.

B—Retired at commencement of 4th lap with broken rear spring.

C—During second round one of the pistons cracked owing to a seized piston ring, and the white metal was melted out of big end bearing of connecting rod, causing retirement.

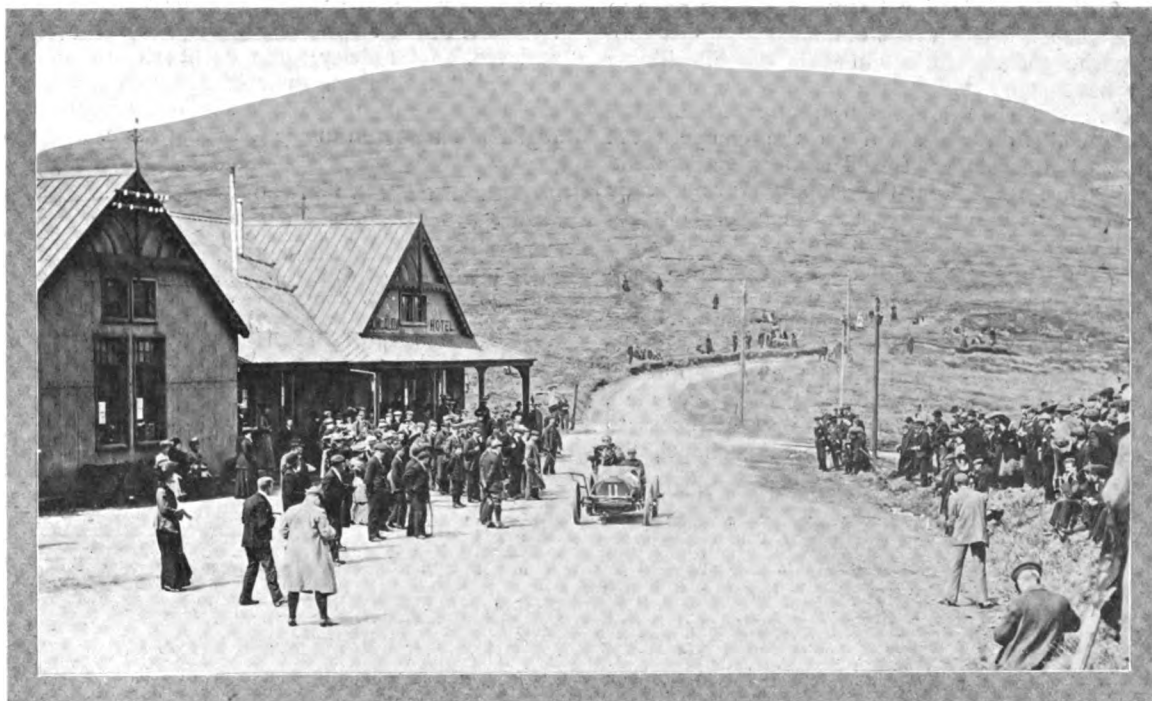
D—Did not complete 4th lap within time limit.

E—

F—Soon after covering the timed half-mile stretch the steering-gear broke, and car was overturned.

G—Only completed 5th lap within time limit.

H—During hill-climb, after leaving Ramsey, wheels slipped at corner, and car charged wall, buckling front wheel and bending axle.



ISLE OF MAN ELIMINATING TRIALS.—Second British representative, the Hon. C. S. Rolls, on the 90-h.p. Wolseley (No. 11), passing the Snaefell Bungalow.

tions of former times, needless to say, comes the ceremony of Promulgation of the law authorising the Trials to be held. When properly and duly carried out, the function has elements of picturesqueness which unfortunately, last year, owing to the fact that it had to be held under a corrugated roof of umbrellas, were

scarcely noticeable. But this year, though the weather was somewhat dull and hazy at Douglas, it was fine at St. John's, where is the mound or hill on which from time immemorial the Tynwald has been held, is situated. It is, perhaps, something of a novelty to many to commence an automobile event with a service of prayer. The first



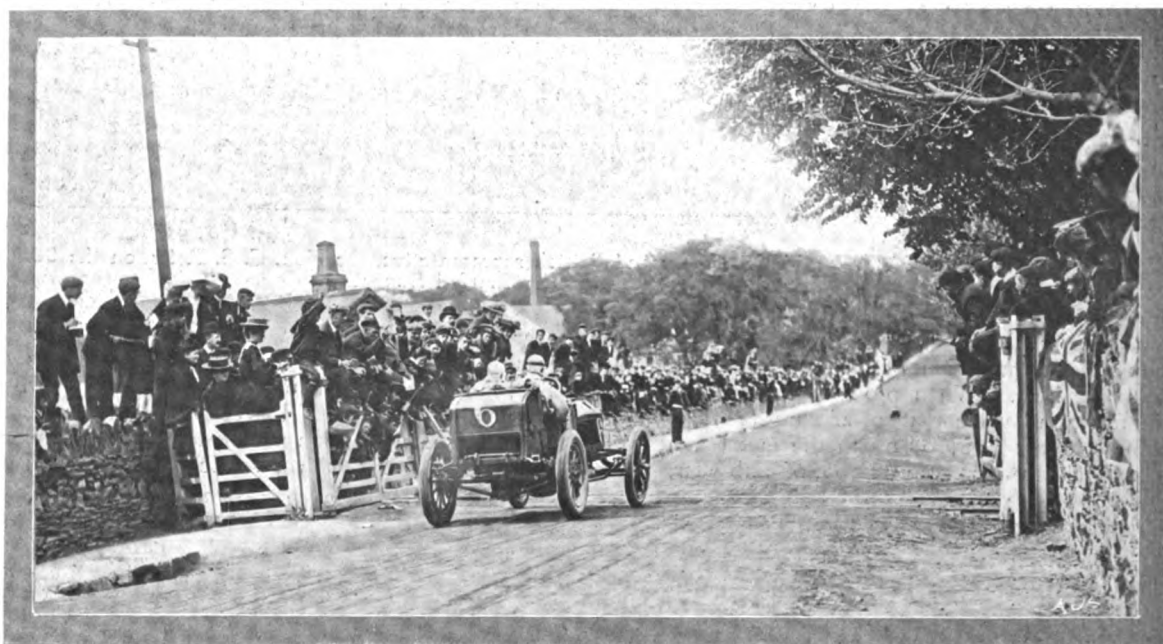
ISLE OF MAN ELIMINATING TRIALS.—Third British representative, Mr. C. Bianchi, on his 90-h.p. Wolseley (No. 4), on the down grade of Snaefell.

portion of the "Promulgation" consisted of a service in St. John's Chapel, where a relic of ancient times is provided by the rushes strewn in the porch. These probably have some antiquarian significance, and are not, as some seemed to think, a subtle suggestion of the probable speed to be attained on the course. All the principal officials of the Island were present. There were Deemster Keen, the Deputy Governor, the Members of the House of Keys, the Mayor of Douglas, the Bishop of Sodor and Man (who performed the ceremony) and, needless to add, Mr. Hall Caine, with sword-bearers and high-bailiffs, and other more or less picturesque officials, mingled up with leather-coated automobilists, the naturally dignified movements of the former being sometimes expedited by the close approach of a motor horn. A contingent of Naval Reserve men, militia, and police added colour and impressiveness to the proceedings. After the service in the chapel, the

cars were weighed in "first time" below the 1,000 kilogs. limit, with the exception of No. 1 (Star), No. 7 (Napier), and No. 10 (Siddeley), and eventually these cars also succeeded in reducing their weight sufficiently to meet the requirements of the rules. The weights ultimately registered are given in the following table.

No.		lbs.
1.	Star (H. G. Goodwin)	2189
2.	" (F. R. Goodwin)	2185
3.	Darracq (A. L. Guinness)	2184
4.	Wolseley (C. Bianchi)	2204
6.	Napier (Cecil Edge)	2185
7.	" (C. Earp)	2185
9.	" (J. Hargreaves)	2184
10.	Siddeley (S. Girling)	2197
11.	Wolseley (C. S. Rolls)	2194
12.	Napier (A. E. Macdonald)	2156

Of course, all the cars had been flying round the 50-mile course, identical, as our readers know, with that on which



ISLE OF MAN ELIMINATING TRIALS.—First reserve for Great Britain, Mr. Cecil Edge, on the 80-h.p. Napier (No. 6), crossing the rails at Quarter Bridge on the second lap.

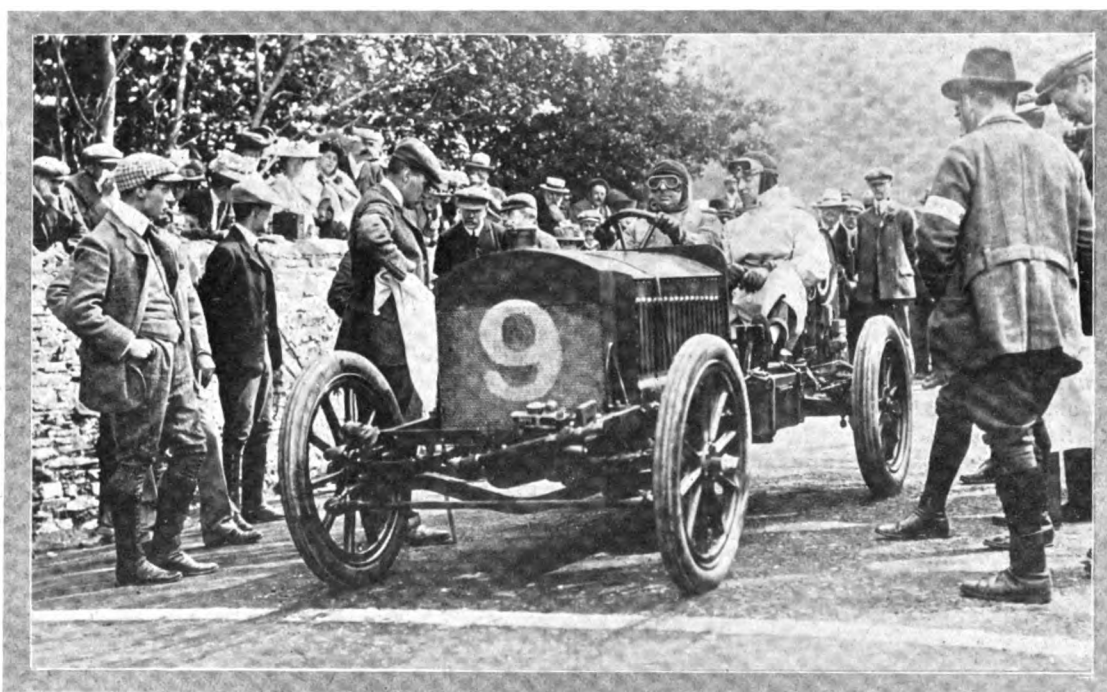
Marshal of the Island gave the order of procession and the officials and others passed from the chapel and assembled on the Tynwald Hill, the naval and militia contingents forming a guard of honour. The Attorney-General first read out the Act in English, and a Manx official followed him with a version in the Manx language. The latter part of the ceremony was commendably short, and it was all over in about five minutes. The general effectiveness of the proceedings was much enhanced by the sunshine prevailing at St. John's, in marked contrast to the weather in other parts of the Island.

While the ceremony of Promulgation was being performed at St. John's, the weighing in of the cars was being conducted at Douglas. Weighing in is, of course, not a violently exciting part of the programme, though it must be admitted that the present occasion was accompanied by a good deal of unconscious humour, due largely to the reluctance with which the "heavier weights" abandoned more or less essential portions of their economy to bring them below the limit. All the

the Trials were run last year, some of them having been at it for days, and some of them for weeks. Quite as much attention was given to Macdonald on his 6-cylinder Napier (which now has all its four wheels fitted with wire spokes) as to any competitor, and, in general, he appeared to be among the first favourites, a fact which he owed to having made the record time of 59m. for the total round, though this record was, naturally, not official. His powers of physical endurance are quite remarkable, and his skill in negotiating corners at high speed are what might be expected of a pupil of Mr. Edge. In hardiness of nerve, however, Mr. John Hargreaves and Girling, who drove so splendidly last year, run him close, and, in fact, there is but little to choose between them. Girling, it is alleged, has been in the habit of taking what is termed the "Hairpin" corner on his second speed. Mr. Cecil Edge, as far as pure pluck is concerned, appears to be the equal of anyone, though some are rather disposed to look upon him as a trifle rash. His 80-h.p. Napier has now completely recovered from its recent accident, and is

apparently none the worse for its collision with the Manx turf. Alterations have been effected in some of the other cars, too, as Mr. Girling's 100-h.p. Siddeley car has been fitted with a pair of new cylinders since its arrival in the Island, the engine not having been considered quite satisfactory, which has given rise to some uneasiness, since great interest is felt in the Siddeley racer, and keen disappointment would be general should it fail to give the best possible account of itself. In the Star cars, too, some unimportant alterations have been made. Originally fitted with "Simplex magneto" igniters, these have been discarded, ordinary ignition plugs having been substituted for them. On the other hand, "Simplex" igniters have been fitted to Mr. Guinness' Darracq, on which they are used in conjunction with a magneto, and apparently give good results.

and in conjunction with it ran a special train from Euston, which it was announced would be provided with a dining car. This essential feature for so long a journey was either by accident or *malice prepense* omitted by the railway company, and all the travellers the train contained were consequently penned up without any possibility of obtaining refreshment till the first stop was made, at Crewe. The scene at the buffet of that station displayed in consequence a considerable recrudescence of primitive instincts, and the time allowed did not suffice for any great store of provision to be laid in for the second period of fasting, comprising the journey from Crewe to Liverpool, and from Liverpool by water to the Island. The boat, which had been specially chartered, was the same with which the travellers to the Isle of Man had become painfully acquainted last year, it being the smallest



ISLE OF MAN ELIMINATING TRIALS.—Second reserve for Great Britain, Mr. John Hargreaves, being started from Quarter Bridge on his 80-h.p. Napier (No. 9).

While in London and the South of England the weather was phenomenally dry, there has been a good deal of recent rain in the Isle of Man, and this, in several places, particularly in the neighbourhood of Snaefell, made the roads somewhat dangerous and uncertain. At the same time, the effect of the rain in laying the dust more than compensated for this partial inconvenience, and has in that way been serviceable to the cause of safety. Full use has, of course, been made of the track for some considerable time past, and all the official arrangements brought to a state of completeness.

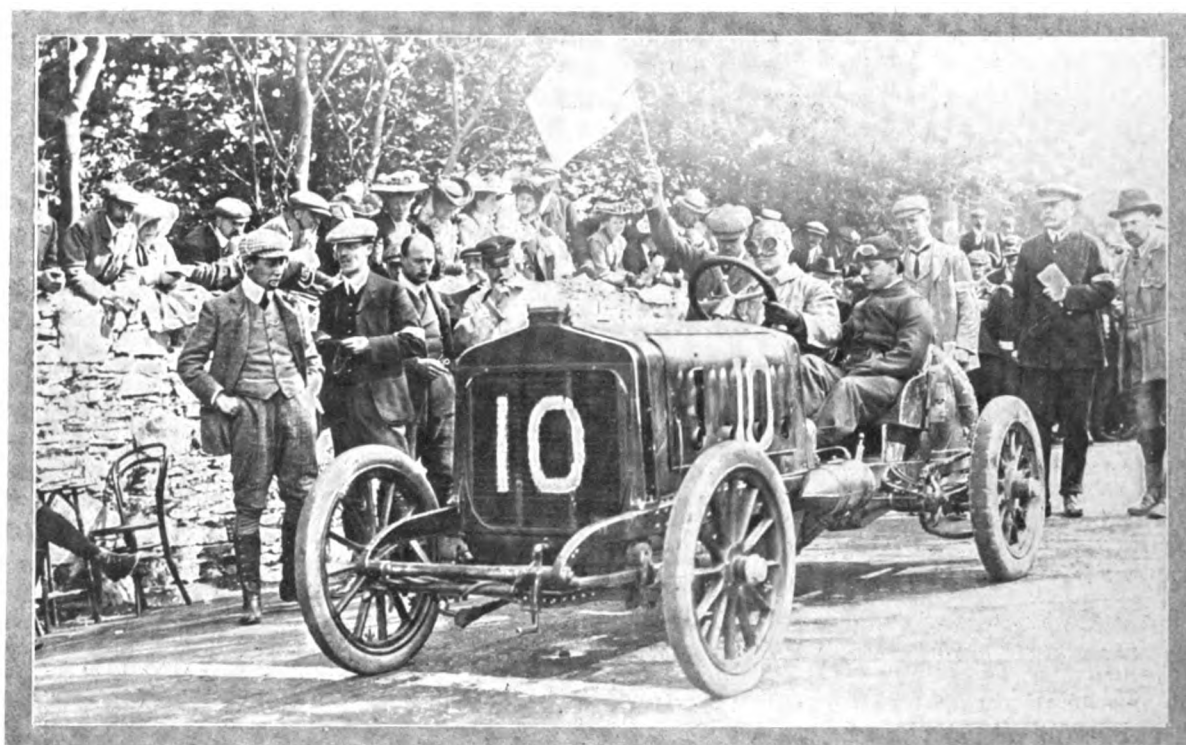
Of course the principal competitors, and all intimately associated with the Eliminating Trials have garrisoned the Island for some weeks past, but naturally there were others who could not afford the luxury of being present earlier than the Saturday preceding the great event. For what was euphemistically—perhaps we should say humorously—termed the convenience of these latter, a special boat had been chartered, which left Liverpool,

and slowest of the fleet of vessels which maintains communication with the mainland. The passage was rough and rainy, but amongst the dauntless few who braved the elements on deck were Earl Russell, Mr. Campbell Muir, Major Lindsay Lloyd, Mr. R. E. Phillips, Mr. Worby Beaumont, and Mr. Cozens Hardy, though "there were others" in more or less acute discomfort below. The "Douglas" is an ancient and venerable craft, to which its lack of accommodation is to be attributed, and halfway across to the Island its ancient and venerable engine came to a dead stop, some of the assembled automobilists being heard to ejaculate between the groans of *mal-de-mer* "more carburettor troubles, I suppose." Indeed, at one time, the prospects of reaching the Island appeared somewhat remote, but it was reached at length, and there amends were made for the discomforts of the voyage, for the hardy travellers received a reception almost amounting to an ovation. The acute islanders have come to recognise the paying

powers of these yearly automobile visitors. Last year the Island had not fully risen to the occasion. It was mainly in the position of a district on which an army of invasion had been unexpectedly quartered. But this year things were different. Inn keepers, lodging house proprietors, restaurant owners, had spread their net wide, and they were all on the watch for customers, whom they received with cordiality and open arms, due to the knowledge that the tourists on their part were generally armed with open purses.

Doubtless the arrangement for a yearly race to be held in the Island will be popular with the Manx. It should also be popular with British automobilists, but if it is to become an established institution,

with the rapidity of a cinematograph apparatus. The crowd continued to increase, and by 8.59, when H. Goodwin, driving the first Star car was flagged off by Major Lindsay Lloyd, who had been for some considerable time practising the art of flag-dropping before an ever-increasing and admiring throng, the crowd was dense. The car did not make the sort of impressive start which one is accustomed to look for when a first class racer springs upon its way, but it gradually gathered speed till after the lapse of the regular five minutes' interval, No. 2 Star, driven by F. Goodwin, was sent upon its course. Neither of these vehicles made an impressive *début*, misfiring rather badly, the acceleration in consequence also being but indifferent. But



ISLE OF MAN ELIMINATING TRIALS.—At the start. Mr. Sidney Girling, on Mr. Lionel de Rothschild's Siddeley racer (No. 10), being dispatched.

something must be done to provide a better train and boat service for the accommodation of those attending the meetings who are not fortunate enough to command automobiles and motor boats of their own, and to be able to run them in conjunction for the occasion.

Tuesday, May 30th.

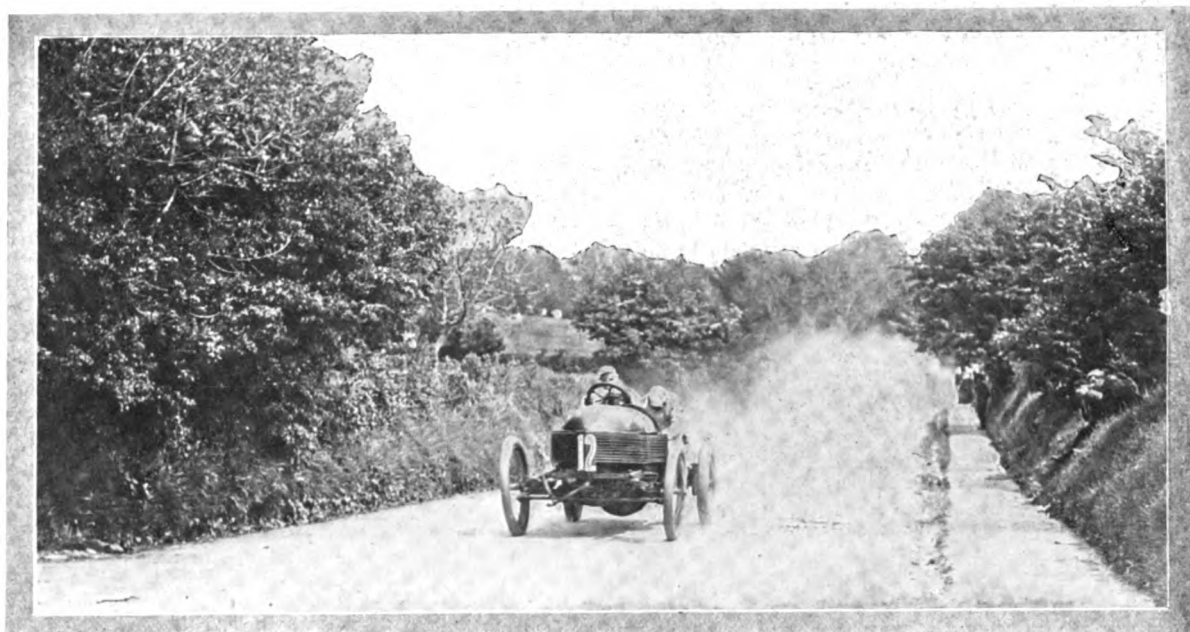
The morning of the eventful day broke auspiciously. The rain and heavy mists of the previous few days had given place to promise of the most brilliant weather, and even at dawn it was plain that the heavens at any rate had determined to favour the event. The sun was scarcely up when excursion boats from what the Manxmen in their insular pride term "the adjacent island," to wit, Great Britain, began to arrive at intervals, and the scene at once became an animated one. Long before seven, all those especially interested in the Trial had assembled at the starting point at Quarter Bridge. By eight o'clock the scene at this most important point of the course was lively in the extreme, as the pilot cars got under way, and the battalions of camera men clicked their shutters almost

a change came with the start of Mr. Lee Guinness arrayed in brown overall and white jersey, on his Scotch-built Darracq, who got away with fine "attack" and splendid acceleration, till he disappeared at the end of the straight lap which had been dust-proofed with a new preparation termed "Dustroyd," specially laid on this part of the course to enable the officials and those interested to estimate the acceleration of the cars, an important point, needless to state, in the selection of racers for international events. The difference in acceleration between the Darracq and the Star car that preceded it was sufficiently emphasised as he disappeared at the end of the stretch in six seconds less, while beating the first Star car over the same distance by seven seconds. Bianchi was the next to take up the running, and his start was practically as effective and workmanlike as that of Mr. Guinness who preceded him. He was followed by Cecil Edge, distinguished by a white helmet above his white dust coat, on the Napier car which Mr. S. F. Edge drove in the Gordon-Bennett of last year, and after him came Mr. Clifford Earp. Mr. John

Hargreaves, with a new Napier car, was next, but his start was not as successful as those of his immediate predecessors, and he took upwards of four seconds longer disappearing, owing to want of success when engaging his clutch. The new Siddeley car, generally described as the "dark horse" of the meeting, piloted by Girling, then sped from the starting point, its performance being watched by the crowd of enthusiastic spectators with the naturally high degree of interest attaching to the first racing appearance of a popular type of English car. He did not make a very rapid start, a fact attributed by most people, at any rate in part, to the circumstance that in order to come within the weight limit, he was running on a veteran set of tyres. Producing something of the bizarre effect in his black mackintosh, the Hon. C. S. Rolls next sped away on the second Wolseley car, while the tail of the hunt was brought up by Macdonald, who got away finely on the 6-cylinder Napier, all the competitors being gone by eleven minutes to ten.

But a short time elapsed before Mr. Lee Guinness completed the first round, having passed the two Star cars *en route*, and completing the first circuit in

were the only competitors who failed to come round. Trouble with the engine, *i.e.*, fracture of a piston, had caused the retirement of Mr. Guinness. Macdonald had been delayed by the ignition going wrong and through trouble with the change-speed-gear, but ultimately turned up two hours late. The cause of Girling's non-appearance was a serious accident, which might have very well proved fatal. He had had serious trouble owing to heating near Castletown, and finally a portion of the steering mechanism broke at a point when the car was estimated to be travelling at about 60 miles an hour, and Girling in consequence ran full tilt into the doorway of a cottage, he and his mechanic both being thrown out—Girling himself being seriously shaken and injured, the two of them were brought in to the Ramsey control by a touring car which had picked them up. No untoward events marked the progress of the third lap, but the competitors, running, gradually dwindled, till by 2 o'clock Bianchi, Earp, Rolls, and Goodwin on the first Star were the only competitors who had arrived. Bianchi was still leading (by time) when the fourth round com-



ISLE OF MAN ELIMINATING TRIALS.—Mr. A. E. Macdonald going "all out" with the 6-cylinder Napier (No. 12) on the road to Ballasalla.

1m. 19s. The first Star car was the second round, but this competitor was delayed at the edge of the control for about twelve minutes, adjusting one of the springs which had become reversed, and securing the guard under the engine. Bianchi, Cecil Edge, Earp, and No. 2 Star followed at intervals without incident. The Hon. C. S. Rolls, who came in next, reported an adventure (it was nearly a tragedy) with a dog in it. In avoiding the quadruped of this persuasion, which always puts in appearance in a race if possible, he charged a bank, causing damage to his auxiliary spokes. Next to arrive was Mr. Hargreaves, and the end of the first lap was brought up by Macdonald, who came in somewhat late, owing to a pump chain having come off.

The second round was less eventful than the first. Hargreaves and Cecil Edge had stoppages for adjusting brakes. Messrs. Guinness, Girling, and Macdonald

menaced, and was driving excellently, so well, in fact, as to excite the general enthusiasm of the spectators. Star No. 1, too, was plodding along persistently though producing on the spectators the impression of comparative slowness, and Rolls was also going strong.

Hargreaves occasioned some anxiety by delay in his arrival, but ultimately he turned up safe and sound, finishing his third round about half-past three. His delay was understood to be due to a slipping clutch and a small amount of leakage in his water circulation, to which causes of trouble, difficulty with his tyres was also added. The only competitors actually taking part in the fifth round were Bianchi, Earp, Rolls, and the first Star car. This round was completed by Rolls at five minutes to five, who was thus the first actually to complete the minimum test, the final and sixth lap being only executed by Earp and Bianchi, since only those com-

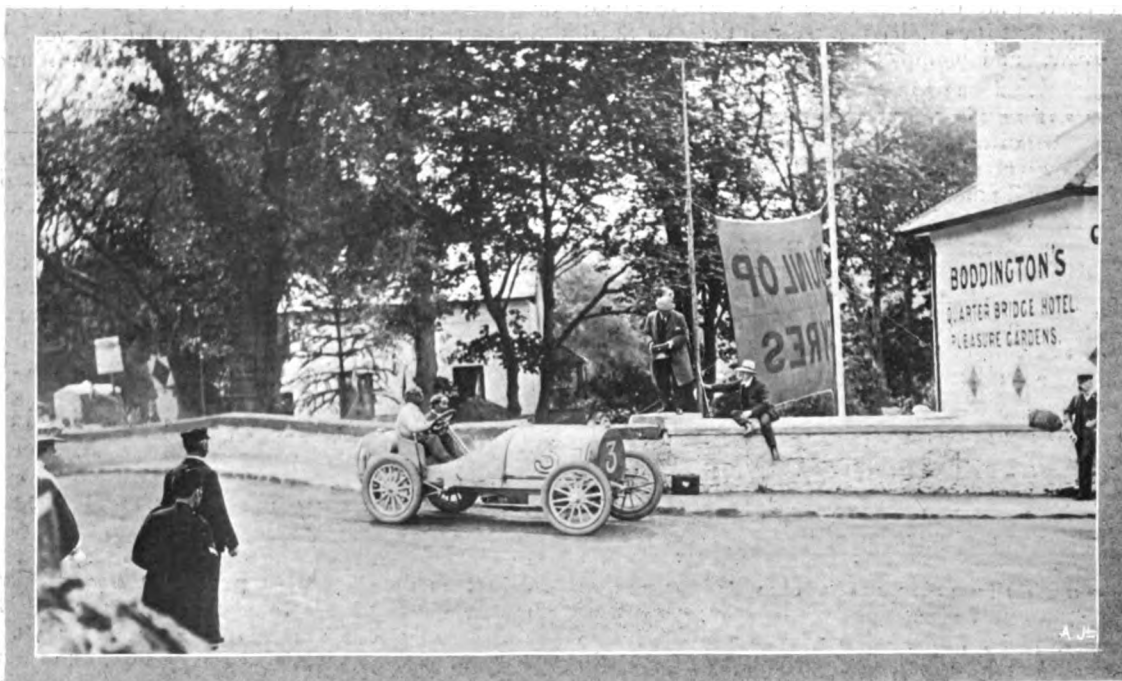
petitors were allowed to enter on it who were likely to finish by five o'clock, and it was obviously impossible for Rolls, whose performance was the next best, to accomplish this.

The times of the different circuits are appended in the table on page 676.

In the controls, particularly in Ramsey, the scene witnessed was of the type with which visitors to these events have become tolerably familiar, and did not fail to preserve its amusing character. At Ramsey, as the cars came in, heralded by railway whistles, they were received by the officials, and after the fixed control times were then at liberty to perform any adjustments, repairs or other arrangements which they might require to execute, as everything of this kind had of course to be done out of control time. As soon as the car was released by the officials, it was surrounded by its friends and supporters, "even as bees flocking a-field in summer

selves by taking the times of the competitors up this difficult half-mile stretch, and it is interesting to note that Bianchi's record up it was 1m. 45½s., which works out at 34 miles an hour, a tremendous pace up such a piece of road.

The trials have been singularly successful and free from anything that can be regarded as serious accident, for even the mishap to Girling, tragic as might have been its results, can hardly be called by this name. Something may, no doubt, be put down to the weather which, exquisitely fine on the day of the race, had been damp and rainy previously, thereby effectively laying the dust over the greater part of the course. The results have been somewhat of a surprise, particularly as regards the want of success of the celebrated 6-cylinder Napier, which holds the world's record in regard to actual speed. But many things contribute to results in events of this kind. It is not only general car-excellence that is needed



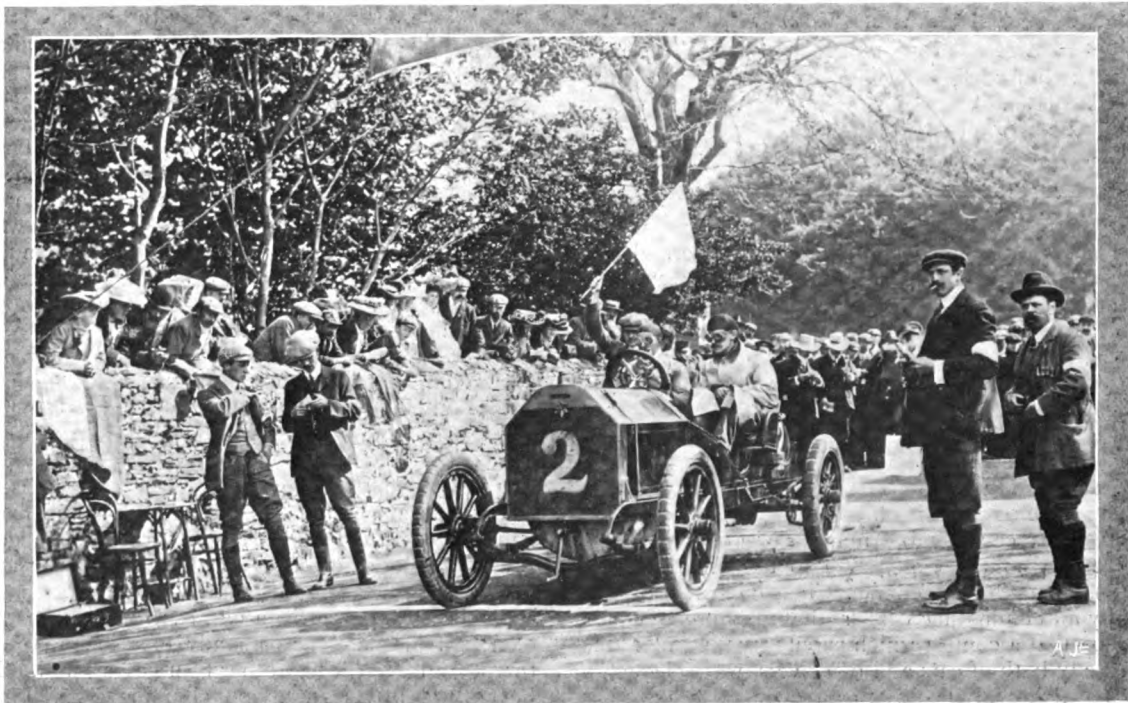
ISLE OF MAN ELIMINATING TRIALS.—The Hon. A. L. Guinness, on his 90-h.p. Darracq (No. 3), crossing Quarter Bridge.

time swarm round their queen," to use a Vergilian simile. In fact, the car became invisible to spectators from the multitude of people attending to it, chief amongst these as usual being the acolytes who were sousing the heated tyres with buckets of water, the fillers drawing off hot water from the radiators and cooling systems and adding fresh fluid, and—as important as any—men with trays of champagne, ginger ale, bananas and other refreshments for the benefit of the heated and more or less exhausted drivers.

From the outward end of this control, interesting observations could be made, for there the cars, shortly after re-starting, could be seen threading their way up past the terrible "Hairpin Corner" towards the summit of Snaefell, being rendered visible by the frequent turnings of the road, resembling in this respect the track up an Alpine pass, at frequent intervals; the way in which they took the corners was in many places clearly observable. Many of the spectators entertained them-

to secure success, the element of luck is an enormous factor.

It is impossible to say from the gross times, which are alone available at present, how far this year's Eliminating Trials show an improvement in point of speed as compared with last year, for, in order to ascertain this, we must know exactly the time spent in control and other deductions. But, taking a rough estimate, there appears to be a slight improvement when we compare the gross times last year with the gross times this year, though it will be understood that any such rough estimate is necessarily subject to subsequent discount. Making a provisional estimate of the gross times, and taking the course as being 51·8 miles round, some comparative figures at any rate can be arrived at. On this basis, Earp's Napier would seem to have maintained an average speed of about 39·5 miles per hour, as against an average of 39 miles per hour by Bianchi, and 35·8 per hour

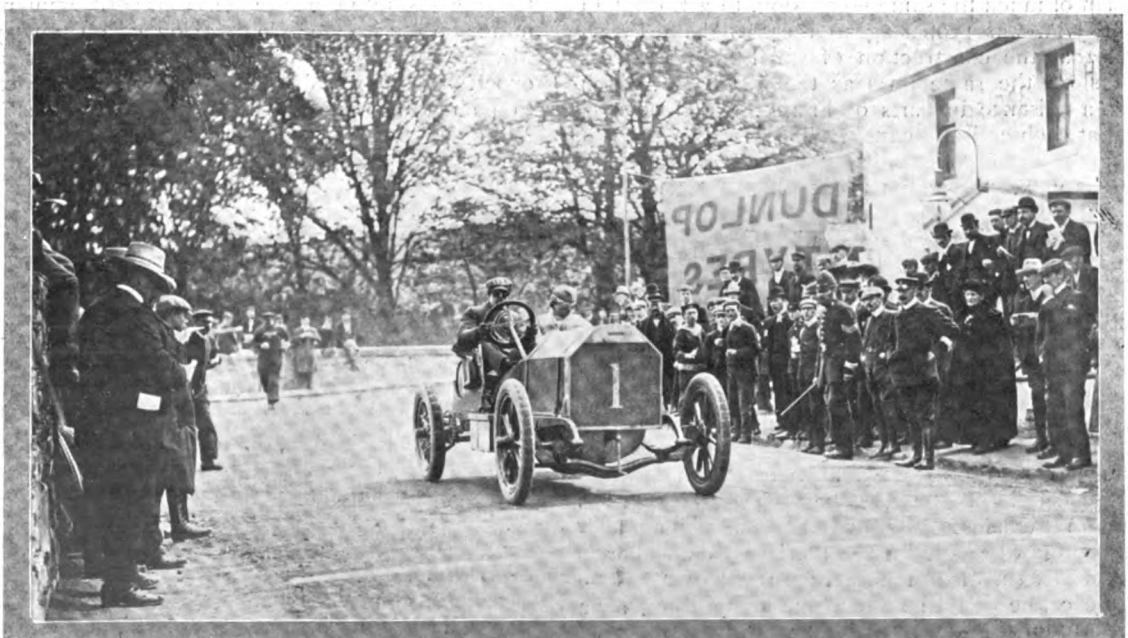


ISLE OF MAN ELIMINATING TRIALS.—No. 2 Star racer, Mr. F. R. Goodwin at the wheel, waiting for the fall of the flag.

accomplished by Rolls. The fastest lap covered by Earp gives a mean speed of 45.5 miles per hour, Bianchi's fastest lap being 41.7, and Roll's fastest lap 40.3—the actual best average time per lap being 1h. 18 $\frac{2}{3}$ m., and the actual lap, 1h. 8 $\frac{1}{2}$ m. Last year, the

fastest average speeds per lap were those of Earp and Girling, 1h. 30m., and the fastest actual lap was covered in 1h. 15m.

The A.C.G.B.I. has, as the result of the competition, made the following selection of drivers and cars to



ISLE OF MAN ELIMINATING TRIALS.—No. 1 Star, driven by Mr. H. G. Goodwin, arriving at Quarter Bridge Control at the end of the first lap.

represent this country in the Gordon-Bennett Race. They are :—

1. Mr. Clifford Earp, 80-h.p. Napier.
2. The Hon. C. S. Rolls, 90-h.p. Wolseley.
3. C. Bianchi, 90-h.p. Wolseley.

With, as reserves :—

- 1st reserve, Mr. Cecil Edge, 80-h.p.
- 2nd reserve, Mr. J. H. Hargreaves, 80-h.p. Napier.

Our readers will call to mind the very unmerited bad fortune that robbed Mr. Earp of the opportunity of representing Great Britain in the Gordon-Bennett Race last year, so that general satisfaction will be felt that this year his great merits as a driver have obtained recognition by his selection to uphold the honour of this country in France.

We have already drawn attention to the fact that nothing in the nature of a fatal, and only one at all serious, accident has been chronicled. But, none the less, there have been, as is only to be expected in such severe trials, a considerable number of minor mishaps. These were, of course, largely due to the difficult, even dangerous, nature of the course. The contest was pre-eminently an eliminating trial, and it was precisely for this reason that a contest which should try the endurance and capacity both of cars and of drivers, was selected—qualities which will be put to an even more exacting test in the actual race on the Auvergne Circuit, which will certainly be more trying both to the nerves of the drivers and to the mechanical construction of the cars than that over the eliminating trial course has been.

A summary of the minor misfortunes which took place is not without interest. Earp, the winner, was practically free from them, but he and Bianchi, who enjoyed similar immunity from misfortune, were the only instances of complete freedom from minor mishaps.



WHILE the Marquis of Queensberry was talking about the employment of the pistol for automobilists, another gentleman of much the same persuasion, to wit, Captain Sergison, J.P., was proposing to the Slaugham Parish Council that the construction of small trenches across the roads, on the same lines as the *Cantiveaux*, which are such a nuisance in parts of France, should be constructed at each end of a certain village, with a view to reducing the speed of motor cars. "For," says the gallant Captain, "though the trenches would do no harm at moderate speeds, they would break the axles of the cars if they were travelling fast." The existence of such gentlemen as Captain Sergison should make automobilists thankful for the common law of the land. If the Captain and his precious parish council do anything of the sort, they will be amenable for damages to any vehicle that may result, and the contention that the vehicle is going at excessive speed will be no bar. Should a fatal accident result in consequence of any damage their trenches produce, it will be a clear case of manslaughter, so perhaps the Slaugham Parish Council had better take legal advice before adopting the counsels of Captain Sergison, J.P. If, further, anybody feels inclined to draw the attention of the Lord Chancellor to the illegal incitements to mischief proposed by a Justice of the Peace, he would be well within his rights. It is a line the Automobile Club might adopt with advantage.

ALL the contentions that we have put forward in this and previous issues regarding the absurdity of the

We have referred to the case of the Hon. C. S. Rolls, who collided with a bank in attempting to avoid a dog.

Cecil Edge had difficulties with his ignition apparatus near Snaefell which caused him half an hour's delay, and his record was otherwise impaired by tyre troubles.

The delays which were experienced by Hargreaves were due, on one occasion near Ramsey, to the engine stopping, and, in re-starting the engine, the starting handle broke, and the car had to be pushed into Ramsey. Brake troubles also happened to him, on the second round, compelling him to stop and make adjustments, and, as already related, on the third round, imperfect action of the clutch interfered with progress.

Before the accident which occurred to Girling, owing to the derangement of his steering gear, he had difficulties both with his tyres and with his change-speed-gear, which, owing to the first gear having stripped the previous night, had been replaced.

Macdonald, as chronicled, lost 14 minutes in one round owing to the pump chain, and on another occasion had troubles due to a broken tooth in his change-speed-gear, while he also collided with a wall in starting from one of the controls, smashing two spokes.

The Darracq car driven by Mr. Guinness was put out of action ultimately, as already mentioned, by a fractured piston, but it had other troubles as well. It overheated three times, firstly on climbing Snaefell gradient, secondly, just as he was about to run into Ballasalla, and once again just after leaving that spot.

The first Star car was compelled to come to a halt at Quarter Bridge, owing to the shackle of its rear spring being thrown over, and in order to make adjustments on the pressure valve, while the second Star was compelled to change sparking plugs at Ramsey on the first lap, and broke a rear spring in coming into Willaston Control after completing the third round.



County Council's scheme of increased tramification, are substantiated by the evidence given by Mr. A. C. Campbell Swinton, before the House of Commons Committee on the London County Council's Tramways Bill. Mr. Swinton, who is an electrical engineer and an expert of many years' standing, and might be expected to be rather prejudiced in favour of the electric tram than otherwise, states categorically that motor omnibuses are preferable as a means of connecting the northern and southern systems. They are cheaper, and would interfere less with traffic.

As regards the proposal of the County Council to take the electric trams over the bridges, the following summary of evidence was given before the same committee by the Commissioner of Police for the City.

A tramway over Blackfriars Bridge would be a source of danger to pedestrians at the most difficult crossing in London.

There would be an incentive to carry it to Ludgate Circus, which would be disastrous.

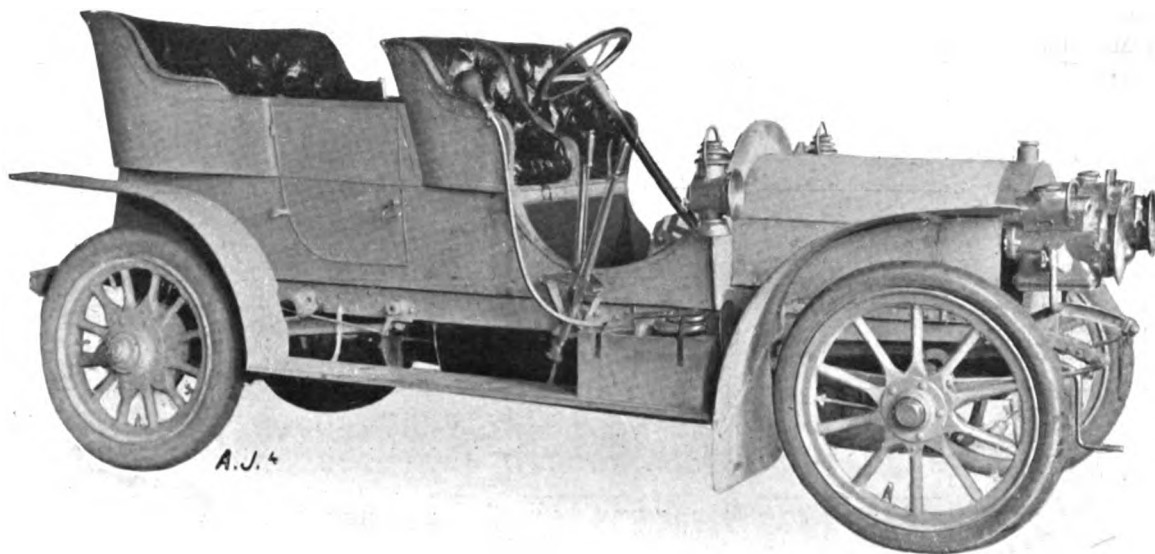
Tramways drove traffic to the sides of the road, and the accommodation of the bridge would, therefore, be reduced by one half.]

Out of 31,589 pedestrians passing over the bridge, only 3,355 turned down the Embankment.

Tramways would not lead to any conceivable reduction in the number of omnibuses, because the latter carried passengers nearer to their destination.

Mr. E. R. Henry, Commissioner of Metropolitan Police, gave evidence in much the same vein, and said that the congestion of traffic near the Houses of Parliament would be enormously aggravated by the proposed "sacrifice of the bridges."

RACES, RECORDS, AND TRIALS.



The 20-25-h.p. 4-cylinder, "All British" Ariel car, which, by its splendid performance in the Scottish Reliability Trials, won the Gold Medal in Class C (petrol cars having three or more cylinders). A similar vehicle also made the fastest time (both in the Club and Open Handicap) in the Gatacre Hill-Climbing Contest, conducted by the Wolverhampton [and District Club last Saturday, and another one was awarded a silver cup in the same Club's Consumption Trials.

SCOTCH RELIABILITY TRIALS—JUDGES' REPORT.

THE highest number of marks possible for reliability is 1,000. One mark is deducted for every minute or part of a minute during which the vehicle was at rest from start to conclusion of the Trial, with the exception of compulsory stops and stops for traffic, or for tyre troubles. One mark has also been deducted for every minute in excess of the maximum time allowed for each stage. At the re-start each morning, and after the compulsory luncheon stop, fifteen minutes were allowed for replenishing and lubricating, and time was taken one minute after the order to start the engine was given.

The Trial consisted of 595½ miles, the bulk of which comprised Highland and mountainous roads, and the committee believe that it will now be conceded that it has formed the most severe Reliability Trial yet held, both from the nature of the course and from the strain placed upon the vehicles taking part.

Hill-climbing tests took place on the Cairnwell Hill, near the Spittal of Glenshee, over a distance of 3,678 feet, having an average gradient of 1 in 8·9, comprising portions of 1 in 6 and 1 in 6·5, and on the Loch-na-Craig Hill, Aberfeldy, over a distance of 3 ms. 1,452 ft., having an average gradient of 1 in 17, varying from 1 in 10 to 1 in 50. The Trial route comprised hills of greater length and steeper gradients than those on which the time tests were made.

A gold medal is awarded in each class to the vehicle having full marks for reliability, stops for tyre troubles being excluded, showing the best results on the basis of the following formula :—

Laden Weight of Car in lbs.

× 1,000.

Aggregate of times taken in hill climbs in mins. × Total petrol consumption during whole Trial in galls.

These medals have been gained by :—

Class I.—Vehicles having One Cylinder—

6-h.p. Light Wolseley, entered by the Wolseley

Tool and Motor Motor Car Company, Limited, Birmingham, and driven by Mr. S. J. Hands.

Class II.—Vehicles having Two Cylinders—

16-h.p.—Albion, entered by the Albion Motor Car Company, Limited, Glasgow, and driven by Mr. Ralph E. Wilson.

Class III.—Vehicles having Three or more Cylinders—

20-25-h.p. Ariel, entered by Thomas Shaw (Dundee), Limited, Dundee, and driven by Mr. Charles Sangster.

In consideration of the meritorious performance of the 24-32-h.p. Mors, entered by Mors, Limited, London, and driven by Capt. Cecil Banbury, the committee have awarded it a Silver Medal.

The Glasgow Cup, presented by a member of the club to the vehicle showing the lowest petrol consumption per ton mile over the whole Trial, has been gained by—

12-h.p. Arrol-Johnston, entered by the Mo-Car Syndicate, Limited, Paisley, and driven by Mr. John S. Napier.

On the next page, we have given in a single table all the more important data contained in the judges' report. We also deal editorially with the results in our front paragraphs.

Now that these final official results have been issued, we are able to give a list of the corrections that are needed in order to bring up to date the table prepared and published by us on May 20th, p. 618, which included all the official information that was then available. These small corrections are :—

CLASS A.—8-h.p. Darracq (31), on the fourth day, hill stops, 2 marks.

CLASS B.—12-h.p. Arrol-Johnston (9), on the second day, lost 23m., not 31m., for water connection, but on the third day lost 1m. driving stop.

12-h.p. De Dion (20), on the second day, lost 3, not 1, marks on hill; and 2, not 1, on the fourth day.

10-h.p. Ford (27), on the third day, had additional driving stop 1m.

Official No.	*Description.	Price.	Seats.	Bore and Stroke.	Tyres.			Average Laden Weight.	Petrol Consumption.			Com- bined Hill- Climbs.	Marks gained for Consumption and Hill-Climb.**	Official No.	
					Make.	All or Front.	Back.		Total.	Per Ton Mile.	Car Miles per Gallon.				Ton Miles per Gallon.
CLASS A.—Petrol Vehicles having One Cylinder.															
19	8-h.p. De Dion	242	3	mm. or ins. 100 x 120	Dunlop	760 x 90	—	18 1 11	galls. 23.625	0.43	25.19	23.136	2,967	1,000	19
26	9-h.p. Cadillac	189	2	5 x 5	Dunlop	760 x 100	—	17 0 15	20.375	0.39	29.208	25.048	4,358	1,000	26
31	8-h.p. Darracq	199	2	112 x 120	Michelin	700 x 85	—	16 2 12	16.125	0.32	36.906	30.644	—	997	31
36	8-h.p. Wolseley	175	2	4 1/2 x 5	Dunlop	700 x 85	—	14 3 13	17.875	0.04	33.293	24.709	5,303 G.M.	1,000	36
CLASS B.—Petrol Vehicles having Two Cylinders.															
1	16-h.p. Albion	405	4	4 1/2 x 5	Shrews.-Chal.	34 x 2 1/2	34 x 3 a	29 2 15	30.125	0.34	19.755	29.268	4,835 G.M.	1,000	1
9	12-h.p. Arrol-Johnston	390	4	4 1/2 x 6 1/2	Shrews.-Chal.	35 x 2 1/2	41 x 2 1/2	28 0 21	19.125	0.23	31.118	43.851	6,826	953	9
13	10-h.p. Argyll	350	4	95 x 140	Michelin	810 x 90	—	33 23 27	24	0.34	27.706	29.347	4,351	958	13
18	12-h.p. Clement	365	4	105 x 140	Dunlop	810 x 90	—	89 24 37	25.125	0.34	23.686	29.378	5,113	999	18
20	12-h.p. De Dion	445	4	100 x 120	Dunlop	815 x 105	—	30 0 4	26	0.29	22.889	34.389	—	992	20
27	10-h.p. Ford	225	4	4 1/2 x 4	Continental	28 x 3	—	43 19 0 14	37.875	0.66	15.712	15.032	1,845	995	27
30	12-h.p. Darracq	363	4	112 x 120	Continental	750 x 85 c	—	28 24 2 18	Withdrawn	—	—	—	—	—	30
37	14-h.p. Wolseley	450	4	4 1/2 x 5	Dunlop	870 x 90	—	25 2 2	23.25	0.3	25.596	32.588	7,421	999	37
40	12-h.p. Gladiator	365	4	105 x 140	Dunlop	810 x 100	—	27 0 18	24.25	0.29	24.541	33.412	5,347	993	40
CLASS C.—Petrol Vehicles having Three or more Cylinders (all have Four Cylinders, except No. 35).															
2	16-20-h.p. Humber	472 1/2	4	95 x 125	Dunlop	815 x 105	—	21 26 1 27	33.875	0.43	17.568	23.289	5,828	1,000	2
3	8-10-h.p. Humber	252	3	3 1/2 x 3 1/2	Dunlop	760 x 90	—	37 20 3 9	25.75	0.41	23.111	24.07	5,860	992	3
4	15-h.p. Chapard-Walker	450	4	86 x 130	Continental	810 x 100	—	75 26 3 24	42.5	0.53	14.003	18.889	4,405	993	4
5	16-20-h.p. Gladiator	600	4	95 x 130	Dunlop	870 x 90	880 x 120	10 34 1 23	50.125	0.49	11.872	20.451	3,677	976	5
6	12-h.p. Sunbeam	451 1/2	4	84 x 120	Michelin	810 x 90	—	36 27 2 16	23.25	0.28	25.596	35.37	—	993	6
7	18-h.p. Siddeley	650	4	4 x 4	Continental	870 x 90	—	20 27 0 6	29.5	0.36	20.173	27.268	7,017	989	7
8	20-25-h.p. Ariel	750	4	4 1/2 x 4 1/2	Dunlop	870 x 90	880 x 120	24 35 2 7	35.875	0.34	16.588	29.536	8,009 G.M.	1,000	8
10	24-32-h.p. Mors	950	4	108 x 150	Michelin	915 x 105	920 x 120	33 2 18	36.25	0.36	16.417	27.625	7,808 G.M.	1,000	10
11	14-h.p. Minerva	295	4	90 x 115	Dunlop	810 x 90	—	23 1 1	31.625	0.45	18.818	21.861	5,110	994	11
12	12-h.p. Swift	375	4	80 x 90	Dunlop	810 x 90	—	23 0 5	25.625	0.37	23.224	26.765	5,420	991	12
14	18-22-h.p. Argyll	600	5	95 x 130	Michelin	875 x 105	—	29 3 0	Withdrawn	—	—	—	—	—	14
15	16-20-h.p. Argyll	550	5	88 x 130	Continental	880 x 125	—	106 35 2 27	54	0.508	11.021	19.705	7,481	997	15
16	30-h.p. Daimler	950	4	124 x 150	Dunlop	870 x 100	875 x 105	12 32 2 21	43.875	0.45	13.564	22.226	4,317	899	16
17	16-h.p. Clement	560	4	95 x 130	Continental	915 x 105 a	—	4 29 3 11	60.918	0.67	9.918	14.811	4,105	990	17
21	24-h.p. Gormain	685	4	4 1/2 x 5 1/2	Dunlop	920 x 105	—	31 1 16	37.875	0.4	15.712	24.628	7,450	1,000	21
22	24-h.p. Thornycroft	750	4	4 1/2 x 5	Michelin	810 x 90	—	25 1 4	39.125	0.52	15.21	19.261	3,479	994	22
23	12-h.p. Pipe	390	4	80 x 124	Continental	810 x 90	—	28 3 1	31.875	0.37	18.67	26.888	5,220	1,000	23
24	12-16-h.p. Richard-Brasier	575	4	78 x 110	Continental	870 x 90	875 x 105	34 0 6	48.625	0.47	12.239	20.846	—	847	24
25	24-h.p. Ryknield	650	4	4 x 6	Continental	32 x 3 1/2	—	25 0 21	Withdrawn	—	—	—	—	—	25
28	20-h.p. Ford	450	4	4 1/2 x 4	Continental	815 x 105	820 x 120	27 0 7	40.875	0.41	14.559	23.834	6,149	—	28
29	15-h.p. Darracq	485	4	90 x 120	Michelin	880 x 120	—	32 3 0	40.875	0.41	14.559	23.834	6,149	1,000	29
32	30-40-h.p. Belsize	650	4	4 1/2 x 5	Michelin	870 x 90	—	26 3 2	40.75	0.51	14.604	19.561	3,876	33	32
33	15-20-h.p. Brooke	550	4	3 1/2 x 4 1/2	Michelin	870 x 100	—	Did not start.	—	—	—	—	—	—	33
34	24-30-h.p. Beaufort	650	4	110 x 130	Continental	870 x 100	—	15 1 10	27.25	0.58	21.839	16.764	—	34	34
35	7-9-h.p. Vauxhall	210	2	3 x 3 1/2	Dunlop	700 x 80	—	37 3 9	Withdrawn	—	—	—	—	—	35
38	30-40-h.p. Martini	1,000	4	125 x 140	Dunlop	915 x 105	920 x 120	37 3 9	Withdrawn	—	—	—	—	—	38
39	20-24-h.p. Drummond	475	4	4 1/2 x 5	Dunlop	850 x 105	—	34 2 7	35.875	0.38	16.588	26.488	6,884	1,000	39
41	20-h.p. Vinot-Degé	625	4	103 x 130	Michelin	875 x 105	—	31 3 21	35.875	0.38	16.588	26.488	6,884	1,000	41
42	12-14-h.p. Gladiator	480	3	80 x 120	Dunlop	810 x 100	—	45 25 1 16	37.125	0.49	16.03	20.336	4,588	1,000	42
43	12-14-h.p. Argyll	475	4	84 x 110	Michelin	875 x 105	—	27 1 5	32.25	0.39	18.453	25.034	5,003	1,000	43
44	12-14-h.p. St. Vincent	445	4	84 x 110	Continental	870 x 90	—	27 3 11	Withdrawn	—	—	—	—	—	44
								765						35,052	

** Marks in block figures apply to cars gaining non-stop certificates.

The formula is as follows:—

Laden weight of car in lbs. \times Total petrol consumption during whole trial in gallons

S. M. Silver medal.

c Michelin tyres on rear wheels.

d Samson on rear wheels.

+ No marks recorded in respect that full load not carried during entire trial.

|| Silencer trouble on Aberfeldy Hill.

¶ Shed passenger on Cairnwell.

G. M. Gold medal.

Reilloc.

b Shrewsbury and Challiner solids.

+ No marks recorded in respect that full load not carried during entire trial.

¶ Shed mechanic on Cairnwell.

|| Silencer trouble on Aberfeldy Hill.

¶ Shed passenger on Cairnwell.

CLASS C.—16–20-h.p. Humber (2) made a "virtual" not an "actual" N.S.

12-h.p. Sunbeam (6), on the fourth day, lost an additional mark for hill-climb.

14-h.p. Minerva (11), on the first day, made a 1m. stop.

12-h.p. Swift (12), on the third day, experienced trouble with a radius-rod, *not* with the radiator.

18–22-h.p. Argyll (14), on the second day, lost 2 additional marks on hills.

30-h.p. Daimler (16) lost additional minute on fourth day for emery on clutch.

12-h.p. Pipe (23) lost additional mark on the third day, replacing spark-plug.

24-h.p. Ryknield (25), on the third day, lost 53m., *not* 92m., due to pump, but spent remaining 39m. adjusting carburettor, plugs, &c.

20-h.p. Ford (28), on the second day, carburettor 2m., *not* commutator 3m.; and on the third day, carburettor 27m., *not* 15m.

7–9-h.p. Vauxhall (35), on the first day, silencer 9m., *not* 19m., and carburettor 8m.; on the second day, lost additional 2m. for hill stops.

20–24-h.p. Drummond (39), on the third day, before withdrawal, carburettor and plugs 39m., starting handle 3m.

12–14-h.p. Gladiator (42), on the second day, 30m. for tyres.

Withdrawals and their causes:—

12-h.p. Darracq (30), timing-wheel fired on the third day.

18–22-h.p. Argyll (14), cardan-shaft bent by fouling culvert on road on the third day.

20-h.p. Ford (28), withdrawn at Pitlochry.

15-h.p. Darracq (29), clutch-gear overheated on the fourth day.

30–40-h.p. Martini (38), withdrawn at Edinburgh, non-stop to there.

20–24-h.p. Drummond (39), steering-gear broke on the third day.

12–14-h.p. St. Vincent (43), clutch trouble on the third day.

Anti-skid Devices.—No less than nine of the cars (Nos. 2, 3, 5, 8, 19, 22, 35, 39, and 42) had corrugated tyres on all four wheels, and a further six (Nos. 11, 17, 18, 26, 38, and 40) had them fitted to the rear wheels. Of the six cars having Samson non-slipping treads, No. 21 was so fitted on all four wheels, and Nos. 23, 27, 28, 30, and 31 had their driving tyres alone equipped with them. No. 41 had "Grose" treads on its driving wheels.

Ab Kettleby Hill-Climb.—For the second year, an interesting competition was held last Saturday on this famous hill, which is stated to be the steepest ascent in

the Midlands. Last year the Nottingham Automobile Club organised the event for their own members, but this year they combined with the Derbyshire and Leicestershire Clubs in order to make the gathering of even greater importance. Ab Kettleby Hill is a delightfully wooded piece of country on the Malton Road, the stretch over which the cars are tested being a little short of a mile, having a gradient of 1 in 8, with one especially stiff bit rising to about 1 in 5. Glorious weather prevailed, and some excellent performances were made during the day, although, unfortunately, under the new ruling of the A.C.G.B.I. the actual times of the competitors are not published, and the interest in such an event therefore greatly diminished. This year a challenge cup, for the most meritorious performance, to be competed for annually, offered by Mr. W. B. Dupre, the Conservative candidate for the Loughborough division, was a coveted trophy to be fought for, with the result that about 60 cars were present at the hill, of which 40 took part in the competition.

All the arrangements were admirably carried out under the joint auspices of the three secretaries of the respective clubs, viz., Mr. M. B. Grainger (Notts.), Mr. A. McAlpin (Leicester) and Mr. C. J. Allin (Derby), who officiated as clerks of the course. Colonel L. Powell, of Melton Mowbray, acted as starter, and the timekeeping was in the hands of Messrs. C. Perry, Ward and R. S. Clifford, junior. A conspicuous feature of the gathering was the help given, and interest taken in the meeting, by the Leicestershire police. Although the times are not published, it was understood the fastest time was accomplished by Mr. F. A. Bolton, the chairman of the Derby club, on his 30-h.p. Daimler, Mr. J. C. Wilson, on a 26-h.p. Daimler, being the second best in speed. After these two, the best times in the order given, respectively, were made by Messrs. E. H. Arnott (14-h.p. Minerva), Marshall (18-h.p. Mercedes), A. R. Atkey (14-h.p. Minerva), J. C. Doran (15-h.p. Darracq), Leach (22-h.p. Daimler), T. C. Pullinger (16–20-h.p. Humber), F. Hardy (14-h.p. Darracq). The event being a handicap, the actual results and awards have not at present been announced. Mr. Bolton, who made the best time, was presented by Mr. R. S. Clifford, junior, of Loughborough, with a medal.



CONY ISLAND RACES.—At the Brighton Beach Track Races (N.Y.) recently, the 30-h.p. Daimler carriage shown in our photograph made some fine running. After winning event No. 1, this car participated in the handicap, in which, starting from scratch, it secured third place, and later on in the Brighton Beach Handicap, with two minutes' start, it ran second to the "Royal Tourist" Car with 2 mins. 20 secs. start, and was a long way ahead of several other vehicles with substantial handicaps.

Gatacre Hill Climb.—The Wolverhampton Automobile Club on Saturday last held their annual hill-climbing handicaps on Gatacre Hill, Stourbridge Road, Bridgnorth, when some excellent times were made on this stiff bit of road. There were two distinct events for the day, viz., a Club Handicap and an Open Handicap, the course in each case being the same, viz., 808 yards with a total rise of 139 feet, comprising gradients from as high as 1 in 8.5, the average being 1 in 17.5. The fastest time of the day was made by Mr. Sangster's 20-h.p. Ariel, of 1m. 19 $\frac{3}{4}$ s., this time curiously being identical both in the Club and Open Handicaps. Under the formula upon which the results have been based, Mr. Bayliss' Panhard in the Club Handicap takes first place with 2m. 25s., Mr. Evans' Wolseley securing the second position with 1m. 43 $\frac{3}{4}$ s., the next place also going to a

Wolseley, Mr. Owen's, with 1m. 46 $\frac{1}{2}$ s. In the Open Handicap Mr. Evans' Wolseley takes premier position with 1m. 41 $\frac{1}{2}$ s., whilst Mr. Owen's Wolseley, under the formula, follows two Sunbeam cars with the time of 1m. 46 $\frac{1}{2}$ s. The formula under which the handicap was determined was

$$\frac{\text{Time in seconds} \times \text{h.p.}}{\text{Total weight in lbs.}}$$

The h.p. formula being $\frac{\text{Cyl diam. in ins.}^3 \times \text{No. of Cyls.}}{3}$

An alteration in the rules governing the competition was introduced, whereby the Sports Committee reserved to themselves the right to refuse any entry without giving their reason, and we learn from Turners Motor Manufacturing Co., Ltd., that, under this regulation, entries of their Turner-Miesse cars were declined. The official results are annexed.

Order.	Driver and Car.	Weight Laden.	Time.	H. P. under Formula.	Resultant.
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Club Handicap.

		lbs.	m.	s.	
1	Bayliss, E. (Panhard) ...	2,469	2	25	8 $\frac{1}{2}$.4894
2	Evans, G. (Wolseley) ...	2,792	1	43 $\frac{3}{4}$	13 $\frac{1}{2}$.5009
3	Owen, W. G. (Wolseley)...	2,753	1	46 $\frac{1}{2}$	13 $\frac{1}{2}$.5208
4	Cureton, T. (Sunbeam) ...	2,849	1	55 $\frac{1}{2}$	13 $\frac{1}{4}$.5319
5	Bayliss, P. (Renault) ...	2,927	1	42 $\frac{3}{4}$	16 $\frac{1}{2}$.5714
6	Gatis, G. (Enfield) ...	2,451	2	31 $\frac{1}{2}$	10 $\frac{3}{4}$.0580
7	Sangster, C. (Ariel) ...	3,156	1	19 $\frac{3}{4}$	27 .6793
8	Rhodes, S. R. (Ariel) ...	2,871	2	18	14 $\frac{1}{4}$.6769
9	Evans, W. H. (Wolseley) ...	2,701	1	54 $\frac{1}{2}$	13 $\frac{1}{2}$.5738
10	Davis, J. (Wolseley) ...	2,465	3	19 $\frac{1}{2}$	10 $\frac{3}{4}$.8620
11	Mills, T. T. (Sunbeam) ...	2,607	2	9	13 $\frac{1}{4}$.6443
12	Evans, J. O. (Wolseley) ...	2,710	2	13 $\frac{1}{2}$	13 $\frac{1}{2}$.6665

Open Handicap.

1	Evans, G. (Wolseley) ...	2,772	1	41 $\frac{1}{2}$	13 $\frac{1}{2}$.4902
2	Cureton, T. (Sunbeam) ...	2,625	1	39 $\frac{1}{2}$	13 $\frac{1}{4}$.4920
3	Marston, J. (Sunbeam) ...	2,654	1	45	13 $\frac{1}{4}$.5151
4	Owen, W. G. (Wolseley)...	2,753	1	46 $\frac{1}{2}$	13 $\frac{1}{2}$.5237
5	Bayliss, N. (Renault) ...	2,890	1	33 $\frac{3}{4}$	16 $\frac{1}{2}$.5298
6	Evans, W. H. (Wolseley) ...	2,735	1	54 $\frac{1}{2}$	13 .5666
7	Rhodes, S. R. (Ariel) ...	2,856	2	15 $\frac{1}{2}$	14 $\frac{1}{4}$.6667
8	Sangster, C. (Ariel) ...	3,156	1	19 $\frac{3}{4}$	27 .6793
9	Mills, T. T. (Sunbeam) ...	2,607	2	16 $\frac{1}{2}$	13 $\frac{1}{4}$.6812
10	Eastmead, F. (Sunbeam)...	2,966	1	54 $\frac{1}{2}$	14 $\frac{1}{2}$.5663

Bexhill Race Meeting.—The programme of events for this meeting, to be held under the competition rules of the A.C.G.B.I. and the Auto Cycle Club, have now been issued as follows. Entries close at 12 noon on Wednesday, June 7th:—

Tourist Classes.

The distance to be covered will be about three-quarters of a mile. There will be no race unless there are five entries, and there will be no second prize unless there are five starters.

Class A.—Entrance fee, 10s. Handicap for auto cycles with engines not exceeding 80 by 80, or the equivalent volume swept out. First prize, Cup; second prize, the Club's Silver Medal.

Class B.—Entrance fee, 10s. Scratch race for auto cycles with engines exceeding 80 by 80, but not exceeding 85 by 85, or the equivalent volume swept out. First prize, Cup; second prize, the Club's Silver Medal.

Class C.—Entrance fee, £1 10s. For cars the chassis price of which is not less than £350 nor more than £650, to carry four passengers. First prize, Cup; second prize, the Club's Silver Medal.

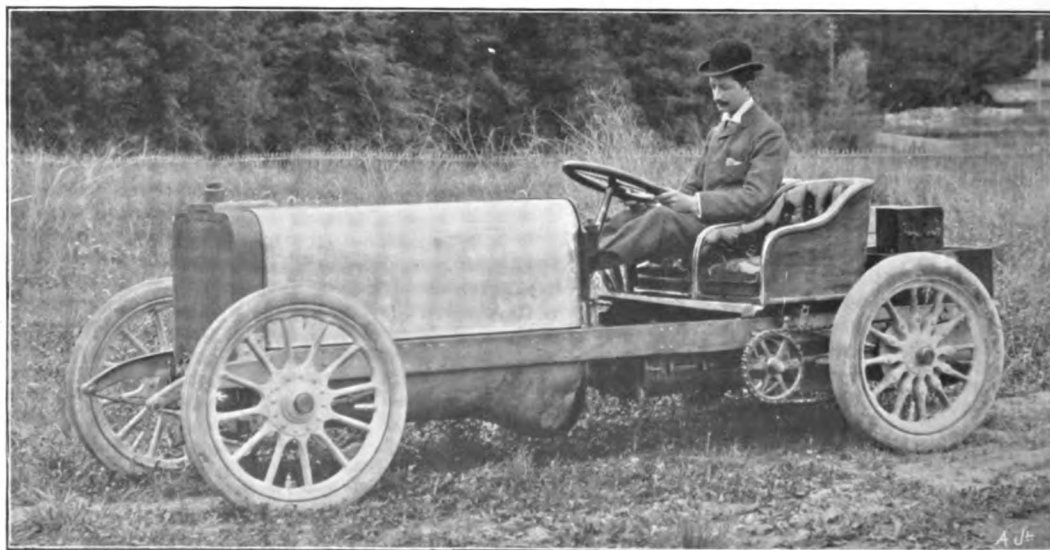
Class D.—Entrance fee, £1 10s. For cars the chassis price of which is over £650 but not more than £900. First prize, Cup; second prize, the Club's Silver Medal.

Racing Classes.

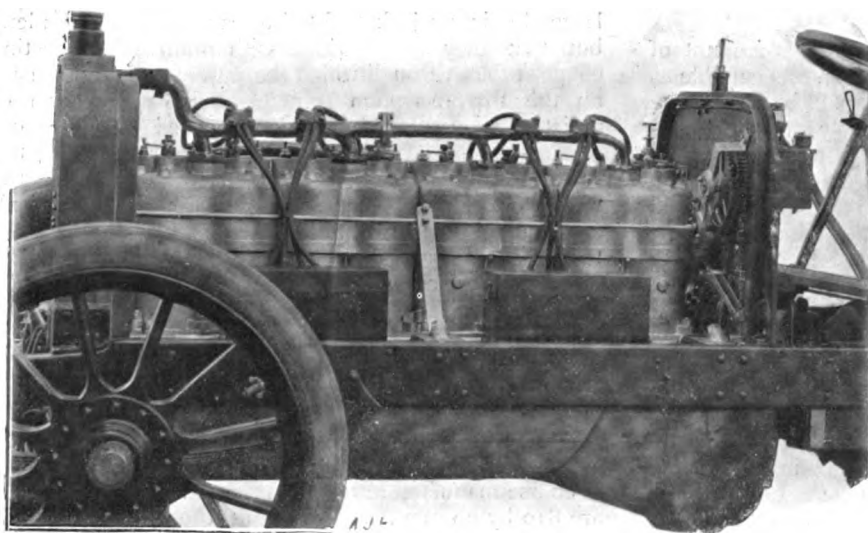
The distance to be covered will be one kilometre, with a flying start.

There will be no race unless there are three entries, and there will be no second prize unless there are three starters.

Class E.—Entrance fee, £1. Scratch race for racing auto cycles.



◆ GORDON-BENNETT RACERS.—One of the Dufaux 8-cylinder cars, which has been built to represent Switzerland this year.



GORDON-BENNETT RACERS.—Side view of one of the 8-cylinder Dufaux engines, fixed in place on its car.

not exceeding 110 lbs. in weight. First prize, Cup; second prize, the Club's Silver Medal.

Class F.—Entrance fee, £4. For racing cars weighing less than 650 kilograms. (12 cwt. 3 qrs. 5 lbs.). First prize, for the best average time for three runs against the watch, Cup; second prize, the Club's Silver Medal.

Class G.—Entrance fee, £5. For cars weighing not more than 1,000 kilograms. (19 cwt. 2 qrs. 20 lbs.). First prize, for the best average time for three runs against the watch, Cup; second prize, the Club's Silver medal.

Tourist Classes.

Class H.—Handicap sweepstake of £1 each for cars entered in Classes C and D, the winner to receive 80 per cent. and the second 20 per cent.

Motor Cycles.

In events 1 and 2 machines must be standard touring machines, subject to the approval of the judges, fully equipped for the road, and fitted with auto-cycle tyres, steel mudguards, tool bag and necessary tools, stand, touring saddle, and an efficient silencer. Cut-outs are prohibited. The tank must hold at least one gallon of petrol.

Filey Sands Motor Races.—The Yorkshire A.C. have matters well in hand in connection with these Speed Trials that are to take place on Whit-Monday next. A local committee has been formed at Filey to co-operate with the Yorkshire Club. This committee has undertaken to provide and protect the course, and, in addition to ploughing two deep furrows on the landward side, beyond which the public will be prohibited, and erecting flags at intervals of a few yards, 60 local men will be employed as volunteer constables to keep the public off the track. Nothing will be omitted to ensure the safety of the public who will be present witnessing the races.

A trophy, to be called the Filey Trophy, of the value of 30 guineas, has been presented for open competition in Class H for racing cars not exceeding 1,000 kilograms. In weight, the trophy, if won twice in succession or three times in all, to become the absolute property of the person so winning it.

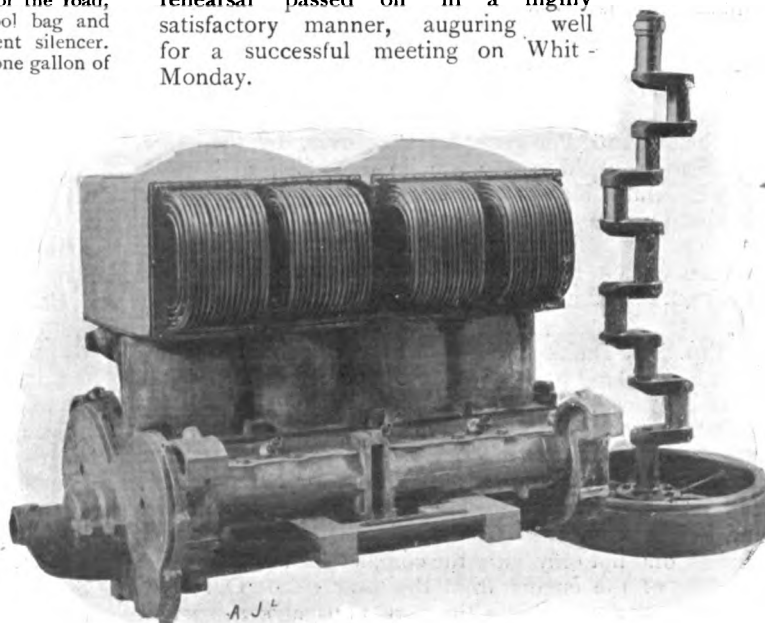
This is in addition to the five trophies, and other valuable prizes, already announced.

The Filey Gardens Committee has arranged an elaborate and interesting programme for visitors from June 10th to June 12th. The band of the 18th Hussars will be in attendance, together with well-known vocalists, and the biograph.

On Saturday last, a deputation from the Yorkshire Club, consisting of Messrs. E. H. Hepper (chairman of the General Committee), W. Bemrose Green (a vice-president and chairman of the Competitions Committee), Charles H. Wilson, J.P., and Robert Crossley, on a 24-30-h.p. Belsize car, Messrs. Charles P. Wilson (hon. sec. of the club) and A. W. Roslington (hon. sec. of the Competitions Committee), on a 12-h.p. Lanchester, left Leeds for Filey,

where the members of the deputation were met by representatives of the Filey Local Committee, together with Major Dunlop, the Chief Constable of the East Riding of Yorkshire, who has promised every assistance, and is personally doing all he can towards making the meeting a success.

The deputation visited the sand where, under the directorship of Major Fell (chairman of the Course Committee), the course had been prepared and flagged, and the local volunteer constables were instructed as to their duties on the day of the races. Cars driven by Messrs. Crossley and Roslington were run up and down the course, which was found to be excellent, and good results were obtained in the way of speed. The rehearsal passed off in a highly satisfactory manner, auguring well for a successful meeting on Whit-Monday.



GORDON-BENNETT RACERS.—The 4-cylinder 150-h.p. Dufaux engine, which has multitubular radiators formed about the cylinder-heads. Alongside the engine is seen the hollow crank-shaft, fitted with its fan flywheel.

GORDON-BENNETT CUP.

ON the Auvergne Circuit, an enormous amount of work is being done to render the course as suitable as possible to the purpose for which it will be put for the French Eliminating Trials and ultimately for the Gordon-Bennett Race on July 5th. Turnings are being eased and enlarged, numbers of barricades erected, and at the level crossing at Volvic a bridge is being completed which will do away with the difficulties which otherwise might arise in respect to this point. It is not quite clear that the other subscribing clubs will be called upon to pay a proportion of the expenses of organising the Gordon-Bennett Race in France, or whether they are to contribute a fixed amount merely. In the former case, a very important question must arise in regard to what may be legitimately regarded as necessary work and alterations in connection with the Auvergne Circuit. As the French Eliminating Trials are taking place over the same course, and as there will be a considerably larger number of competitors racing, it would seem to us that a question might well be raised as to whether a corresponding proportion of the expenses of putting the Circuit into order should not be charged to those responsible for the carrying out of the French Eliminating Trials. That the whole of this expenditure should be divided amongst the clubs represented in the race hardly seems equitable under the circumstances, and possibly the British, German, and other clubs participating, may find it well worth their while to go into this question—and in good time—so that the ultimate amount to be paid by each club may be kept within reasonable limits as far as they are concerned.

WITHOUT exception, the clearest and best map we have so far seen of the Auvergne Circuit has been issued by Messrs. Michelin and Co., the famed makers of the Michelin motor tyres. In this map, the course and all the roads converging thereto are clearly and perfectly seen. Distances are given from point to point, difficult corners and other dangerous spots are marked by various signs, gradients and widths of roads are specially shown, whilst, in addition to a concise description of the course itself, large scale plans are given of the two dangerous points when passing through Rochefort and Pontgibaud. Moreover, by the mere application to Messrs. Michelin and Co., of Sussex Place, South Kensington, a copy of this admirable production can be procured by any of our readers gratuitously. No automobilists travelling to the Auvergne Circuit should fail to secure one of them for their guidance.

THE three Dufaux cars, which have been built to represent Switzerland in the Gordon-Bennett Race, and will, it is to be hoped, do so in spite of the present difficulties which have arisen between the manufacturers and the Swiss Club, consist of two 90-h.p. vehicles having 8-cylinder engines, and a 150-h.p. model with a 4-cylinder motor. Two of our illustrations (pages 688 and 689)—for which we are indebted to Messrs. Dufaux Frères—refer to the former model, and not only show the complete car, but also give a view of the engine from the near side. Our third photograph demonstrates the very unusual construction that has been adopted for cooling the powerful 4-cylinder engine on the other model. The 8-cylinder engines are constructed more or less on usual lines, with all the valves on the same side, and with the cylinders cast in pairs, but it will be noticed that the 150-h.p. engine not only has

large aluminium jackets fitted to each pair of cylinders, but that they are provided with numerous projecting copper tubes, through which the water is free to circulate on the thermo-syphon principle. No other form of radiator is employed, and the speed of the car passing through the air is relied upon for cooling the tubes. It is pointed out that, by this system, the weight of the radiator is reduced to 12 kilogs. (26½ lbs.), and that no circulating pump, external piping, tank, or fan is required. In the same illustration it will be seen that the crank-shaft is hollow and that separate bearings are formed between each crank-pin. The Dufaux chassis are of the chain-driven type, have pressed steel frames and a direct type of steering gear in which a horizontal lever projects from the base of the steering pillar. The wheels are shod with tyres of the Michelin type, which however—like the Eisemann high-tension magneto and the Longuemare carburettor—are of course manufactured in Switzerland. The front tyres are 810 by 90 mm., and those at the back are 820 by 120 mm. It is expected that the 150-h.p. car will be seen in England in July, for it is intended that it shall take part in the speed trials at Brighton.

La Meuse Cup.—A somewhat novel tourist competition was on Sunday last run off, starting from Spa. The test was one for tourist vehicles, and brought together engagements of 67 cars and 11 motor bicycles. A route starting from and returning to Spa of 87 kiloms. was selected, taking in a large number of stiff hills, including the famous Malchamp. The cars were classed according to speeds announced by each respective entrant in the following manner. Each entrant had beforehand to state what speed he was prepared to maintain at various selected hills, and, according to such speed, so was his car classed in the various categories. But, under the rules, whatever speed was selected for the hills necessitated a certain relative speed on the flat as specified by the organisers. Thus 30 kiloms. on the hills necessitated a minimum average of 45 kiloms. throughout the rest of the tour, the maximum speed allowed, however, under any conditions being 60 kiloms. per hour. The results were arrived at by points, and penalising by addition one point per kilom. or fraction of a kilom. for difference between the actual speed maintained on each timed portion of the circuit, and the speed which was originally stated by the entrant. A number of stretches and hills were marked off for timing, but none of the competitors were informed where the actual timing would take place. The results were as follows:—

CAT. 1.—(15-24 kiloms. per hour). (1) Benz, 11 points; (2) De Dion Bouton, 14 points; (3) Vivinus, 16 points.

CAT. 2.—(25-29 kiloms. per hour). (1) Metallurgique, 8 points; (2) Vivinus, 11 points; (3) Dasse, 13 points.

CAT. 3.—(30-34 kiloms. per hour). (1) Aries, 18 points; (2) Mors, 24 points.

CAT. 4.—(34-40 kiloms. per hour). (1) Radia, 19 points.

CAT. 5.—(Above 40 kiloms. per hour). (1) Rochet-Schneider, 17 points; (2) Mercedes, 30 points; (3) Rochet-Schneider, 36 points.

Motor bicycles, 1, 2, and 3, Sarolea.

The novel idea of each entrant selecting his own speeds was, in addition to being a test of the supposed horse-power of a car, a practical lesson to the drivers in judging average speed.

Vanderbilt Cup.—Official details of the American team for this race are now to hand, and give 13 cars as follows:

h.p.	Car.	Entrant.	Club.	Driver.
80	Locomobile	S. T. Davis, jr.	A. C. A.	—
90	Locomobile	H. E. Thomas	A. C. A.	Jos. Tracey
90	Pope-Toledo	A. A. Pope	A. C. A.	H. H. Lytle
60	Pope-Toledo	A. L. Pope	Hartford	B. H. Dingley
40	Matheson	L. M. Palmer	Long Island	—
40	Matheson	C. W. Matheson	A. C. A.	T. Cooper
60	Franklin	E. H. R. Greene	Dallas	W. F. Winchester
38	Royal Tourist	E. D. Shurmer	Cleveland	R. Jardine
60	Christie	J. L. Breese	A. C. A.	W. Christie
60	Premier	G. A. Weidely	A. C. A.	Weidely
50	Haynes	Elwood Haynes	Chicago	F. N. Nutt
40	White	R. H. White	Cleveland	Webb Jay
60	Thomas	H. S. Houpt	A. C. A.	F. J. Titus

It will be noticed that this list includes Dr. Thomas's 90-h.p. Locomobile, which it is definitely stated has been withdrawn from the contest, as also from taking part in the Gordon-Bennett Race on behalf of America. Since America, like other countries, is only entitled to be represented by 5 cars, an eliminating trial will have to be held to determine the cars which will run in the actual race.

Vienna-Breslau.—The results in this Tourist Endurance Trial, of which we gave preliminary particulars last week, are as follows:—

One-cylinder cars: 1st, 8-h.p. Opel Darracq; 2nd, 6-h.p. Peugeot; 3rd, 7-h.p. Oldsmobile.

Two-cylinder cars: 1st, 24-h.p. Peugeot; 2nd, two 24-h.p. Mercedes, equal; 3rd, 24-h.p. Spitz.

Four-cylinder cars: 1st, 60-h.p. Mercedes; 2nd, 40-h.p. Mercedes; 3rd, 35-h.p. Mercedes.

Milan Tourist Trial.—The results of the competition at Milan, of which we gave particulars in our issue of April 15th, p. 486, are now announced, and record almost a clean sweep for the Fiat cars. This fine make of vehicle takes the whole of the leading prizes for big cars except the second in Class 4. No entries were received for Class 3.

Class 1.—Chassis over 14,000 francs, length of circuit 1,500 kiloms. in three stages: 1st, 24-h.p. Fiat, driver Vincenzo Lancia (Queen Margherita's chauffeur); 2nd, 24-h.p. Fiat (Cirano Matteo); 3rd, 24-h.p. Fiat (Alessandro).

Class 2.—Chassis over 14,000 francs, 900 kiloms. circuit in three stages: 1st and 2nd, 24-h.p. Fiats.

Class 4.—Chassis 5,000 to 14,000 francs, 900 kiloms. circuit: 1st, 16-h.p. Fiat; 2nd, 16-h.p. Florentia.

Class 5.—Chassis under 5,000 francs: 1st, 7-h.p. Oldsmobile; 2nd, 7-h.p. Oldsmobile; 3rd, 7-h.p. Peugeot.

Herkomer Competition.—Mr. S. F. Edge has entered his 50-h.p. 6-cylinder Napier car for the Herkomer Touring Competition, to be held in August. It is announced that Prince Henry of Prussia will enter and drive a car himself in this important event.

1,000 Miles on a Crypto Car.—The Crypto Car and Cycle Company arranged, last week, a daily run of one of their ordinary stock 10-12-h.p. two-cylinder cars, the driver being accompanied during each run by a representative of one of the motoring press. Over 1,000 miles, under ordinary touring conditions, were covered in the six days.

As a result, we understand that the only stop for anything approaching mechanical trouble was on the fourth day, when a slackened union on the circulating pump caused a leakage of water and consequent overheating of the engine. The only other involuntary stop was on the fifth day, and was caused by a broken sparking plug. The following were the routes selected:—

May 23.—100 miles out and home, Holyhead Road, 200 miles.

May 24.—London to Worthing *via* Dorking and Horsham, returning *via* Crawley, 116 miles.

May 25.—London to Salisbury, Devizes, Marlborough, and return, 206 miles.

May 26.—London to Littleport and return, 150 miles.

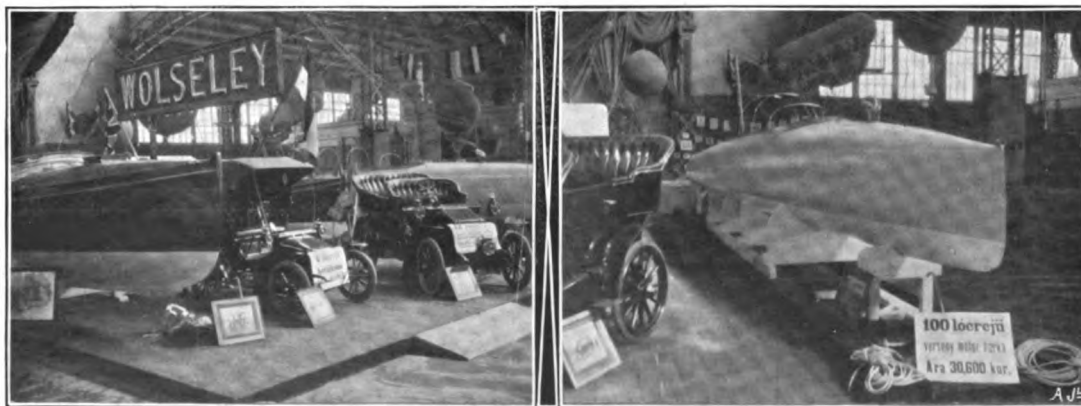
May 27.—London to Banbury, Warwick, and Coventry to London, London to Woodford and return, 215 miles.

May 28.—London to Clacton and back, 140 miles.

The total distance covered was 1,027 miles.

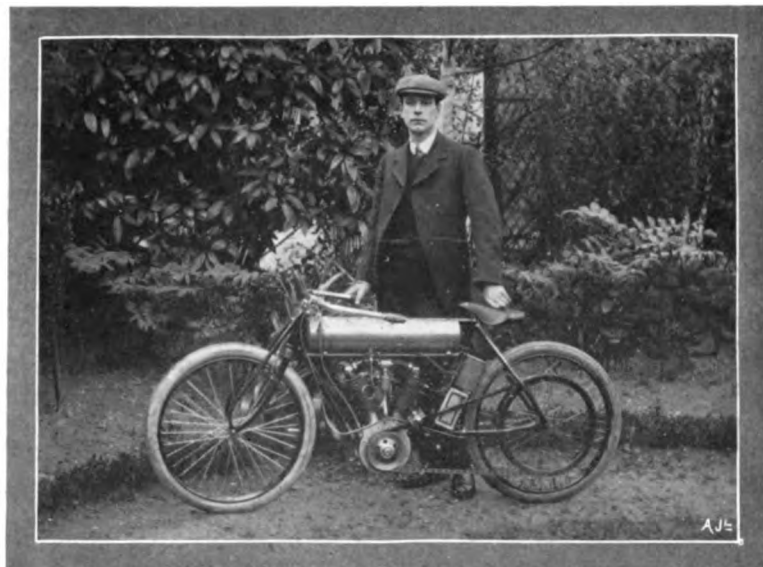
The car was driven throughout by Mr. W. Whittall; no tyre troubles were encountered, and no other parts were renewed or replaced during the whole of the trial.

THE Motor Car Trial of the Southern Motor Club announced for last Saturday had to be postponed until to-day, June 3rd, owing to the provisions in the new competition rules of the A.C.G.B.I.



THE BUDA-PESTH EXHIBITION.—At the Buda-Pesth Exhibition, the only direct representatives of Great Britain were the Wolseley Company, whose exhibit we show in the above photographs. The balloons seen in the background were exhibited by the Hungarian War Department, and one of the drawbacks of the Show was that motor boats, cars, and other exhibits were mixed up altogether indiscriminately on the stands, all classes of exhibits thereby losing much of their individual attractiveness. The cars staged by the Wolseley Company were the 6-h.p. and 12-h.p. standard Wolseley vehicles. The boat in the foreground (on the left) is a 40-ft. cabin cruiser fitted with a 60-h.p. 4-cylinder motor, and the racing hull has a 100-h.p. motor. A front view of the latter will be noticed in the right-hand photograph, in which the three most up-to-date methods of locomotion are seen together, viz., motor car, motor boat, and balloon.

MOTOR CYCLING.



INTERNATIONAL AUTO-CYCLE CUP RACE.—Hodgkinson with the 2-cylinder J.A.P. machine, which he rode in the Isle of Man Eliminating Trials on Wednesday, and which was entered by Mr. Charles Jarrott. The motor cylinder is 70 mm. bore and 95 mm. stroke, the petrol tank has a capacity for 125 miles, whilst the weight has been kept down to the finest point in order to comply with the regulations of the race.

The International Cup Race.—Eliminating Trials.—Instead of keeping to the original course—the same as that for the cars in the Gordon-Bennett Eliminating Trials—the committee decided, a few days prior to the event, to omit the northern section, and so make the competitors turn off at Ballacrairie, near St. John's, and follow the Peel Road to Quarter Bridge. The Peel Road—clearly indicated on our map published last week—is one of the few main roads in the Isle of Man, and runs past Greeba Castle, the residence of Mr. Hall Caine. This alteration shortens the course by almost exactly one-half, so that the circuit is now about 26 miles in length. In other respects, the regulations were left unaltered, and the competitors continued on the course from 3 to 8 on the morning of Wednesday last.

England has, for this year, lost the services of one of her most promising motor cyclists, by the accident sustained by J. T. Crundall some days prior to this event, which resulted in a broken arm. Crundall was to have ridden No. 6, a 6-h.p. Humber, entered by Mr. E. F. Johnson, and he was very generally looked upon as a most likely representative for England in the International event. "Better luck next time" is poor consolation in such affairs, for there is no doubt that a fall from a motor cycle is generally a very nasty experience; possibly Crundall may try his hand at high-speed cars before long, in which case he will doubtless appreciate the change.

Mr. O. L. Bickford was another non-starter, for his 6-h.p. J.A.P. had not been delivered in time for the event, and the three Barry machines completed the list of absentees.

All the machines came below the 50 kilogs. limit. The following are the margins of weight which each machine had in hand. 6 lbs. 9 ozs. extra was allowed in the case of the two Roc machines, Nos. 7 and 8, which used magnetos:—

Entrant.	Machine.	Rider.	Weight margin.
	h.p.		lbs. ozs.
1. C. Jarrott ...	6 J.A.P. ...	W. Hodgkinson	2 0
2. Rev. B. H. Davies...	8 Westlake...	H. P. Maffert...	—
3. H. Collier ...	6 Matchless	C. R. Collier ...	0 8
4. H. Collier ...	6 Matchless	H. A. Collier ...	—
5. H. Rignold...	8 Rignold ...	H. Rignold ...	—
7. A. B. White ...	9 Roc ...	A. B. White ...	2 9
8. Sir A. Conan Doyle	9 Roc ...	T. Tessier ...	1 9
9. C. B. Franklin ...	6 J.A.P. ...	C. B. Franklin	2 0
11. A. A. Hay...	6 Ariel ...	J. F. Campbell	1 0
15. G. A. Barnes ...	10 Barnes ...	G. A. Barnes ...	—
16. G. Wilton ...	10 Barnes ...	G. Wilton ...	—

In the small hours of the early morning of Wednesday, seven of the above machines started, viz.:—Nos. 1, 3, 4, 5, 9, 11 and 15. Only two of these machines actually finished, viz.:—H. A. Collier's Matchless (No. 4), and J. F. Campbell on the 6-h.p. Ariel (No. 11) the latter being the winner in 4h. 9m. 30s. The second place goes to the 6-h.p. Matchless with a time of 4h. 9m. 52s. With regard to the third place, this goes to C. B. Franklin's J.A.P. (No. 9) as this machine made the best average times for the first four laps, although it did not finish the fifth lap, as did Nos. 4 and 11. The speeds attained by the first two machines calculated on the net times given are 28.9 and 28.8 miles per hour respectively. The causes of the breakdowns of other starters were:—Hodgkinson's J.A.P. (No. 1), tyre troubles; C. R. Collier's Matchless (No. 3), buckled wheel; H. Rignold's 8-h.p. (No. 5), accumulators. Under the special rules, the Motor Trophy, which was run off at the same time, goes to the 6-h.p. Ariel (No. 11), ridden by J. F. Campbell. H. Rignold's machine (No. 5) has been selected as the reserve.

Germany is to be represented in the race on the Dourdan Course by three machines, manufactured by the Progress Motorren und Apparentenbau G.M.C.H. (Charlottenburg).

On Sunday, the Austrian eliminating tests were run off in Bohemia, about 200 kiloms. from Vienna, over a very severe circuit. The circuit was a triangle of 60 kiloms. which was covered four times. In the result, out of six starters, three finished, viz., Nikodem (Puch), 3h. 45m. 31s.; (2) Vondrick (Laurin-Klement), 3h. 53m. 57s.; and (3) Merfai (Laurin-Klement), 5h. 11m. 12s. The Laurin-Klement house having been allotted by the Austrian Club the first place in the team, Austria will, therefore, be represented by the Puch and a second Laurin-Klement machine.

Motor Bicycle Track Record.—Last Saturday, Collomb, on a Magali motor bicycle fitted with a Buchet motor and a Vauis carburettor, lowered all the records from 50 kiloms. up to 100 kiloms. at the Parc des Princes, Paris, and also the distance for the hour, the latter being beaten by over 2 kiloms., he thus becoming the holder of the "Coupe Hydra." The chief new times put up by Collomb were as follows:—

Kils.	Old Records.			h.	m.	s.
	h.	m.	s.			
50	36	2½		Anzani (Alcyon)	36	16½
60	43	19		"	44	40
70	50	26½		"	52	6½
80	57	58½		"	59	34½
90	1	5	27½	"	1	7 7½
100	1	12	50½	"	1	14 37

Collomb's distance in the hour was 82.578 kils., against Anzani's old record of 80.50 kils. Before accomplishing these new records, Collomb made eight unsuccessful trials.

MOTOR cycle events for Whit Monday have been fixed and authorised as follows:—At Tunbridge Wells, 5 and 5 miles handicaps; St. Albans A.A., 7 and 10 miles handicaps; Cambridge Show Society, 5 and 10 miles handicaps; Chichester Cycling Club, handicap.

THE Ariel Cycle Company, in drawing attention to their 2½-h.p. light weight motor bicycle, which they claim is the most satisfactory machine at the price on the market, make a very special offer in connection with the sale of each machine. They are prepared to allow £25 for any other well-known make of motor cycle, in good condition and of recent manufacture, as part payment for either one of their light-weight machines, or any other of their latest models.

MESSRS. R. HUMM AND CO., of Market Buildings, Plymouth, who for many years have been established as cycle dealers, repairers, &c., have now determined to lay themselves out for automobile work. They can now supply petrol, execute any repairs, and keep in stock, within reason, all spare parts. A very large field is open in this district for automobiles, and, by way of a start, Messrs. Humm and Co. have secured a 22-28-h.p. Crossley car for one of their clients.

CLUBS AND ASSOCIATIONS.



LADIES' AUTOMOBILE CLUB.—Members of the Club with their cars upon the occasion of their visit to Mrs. Walter's seat at Bearwood last week.

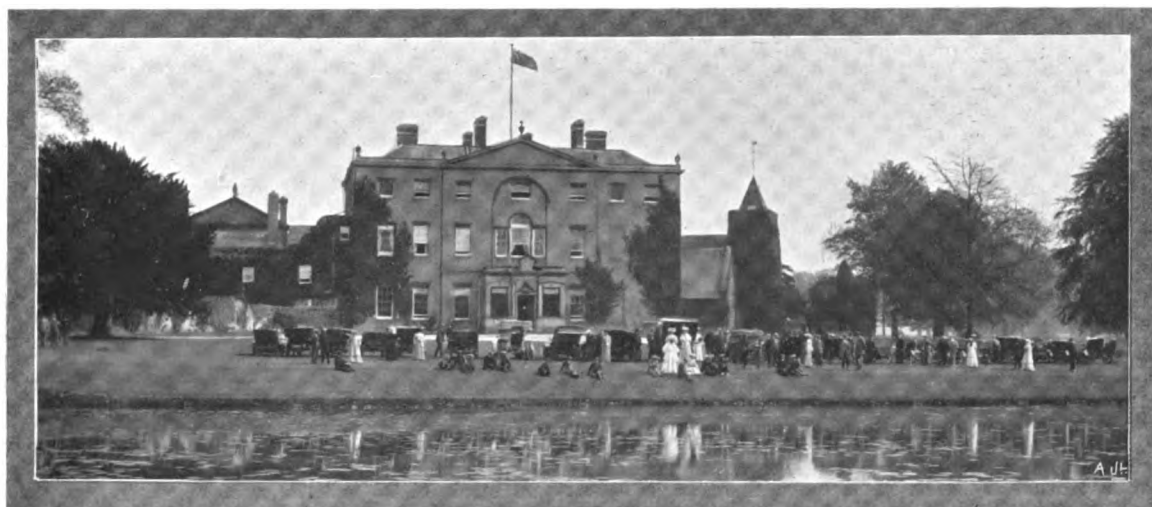
Ladies' A.C.—On Wednesday, the 24th May, the season's first Meet of the Ladies' Automobile Club was well attended. Some sixty members and their friends motored 36 odd miles from London to Bearwood, the home of Mrs. Walter, one of the members of the club and of the committee.

The afternoon was fine, and was most agreeably spent, either walking through the beautiful grounds or examining the works of art in the long gallery.

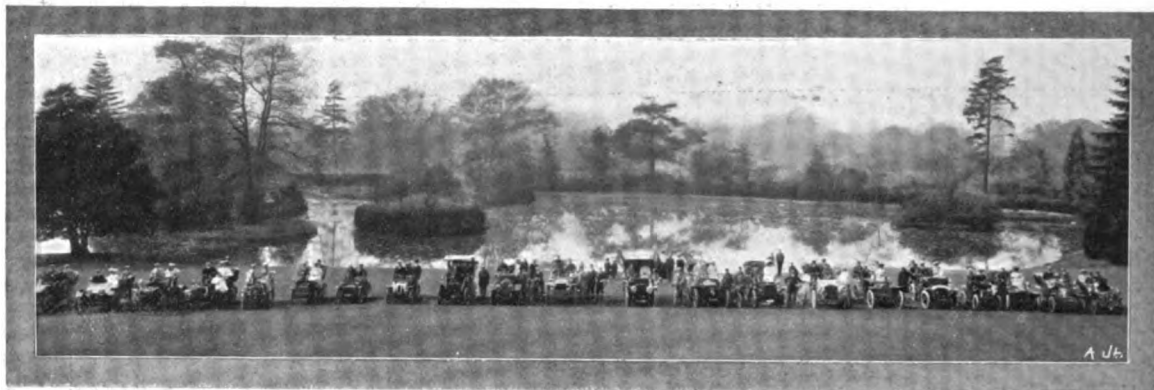
Among others who accepted Mr. and Mrs. Walter's invitation were the following:—Mrs. Ernest Amsden, Miss Nora Barrow, with whom was Miss Wavell, Mr. and Mrs. Borrett, Mr. and

Mrs. Buttemer, Mrs. Harold Browne, Mrs. Chaver, Mrs. Cross and Mrs. Inglefield, Mrs. Dawson, Mrs. S. F. Edge, Mrs. Jardine of Jardines, Sir Henry and Lady Colville, Miss Keene, Miss Kenealy, Lady Manson and Mr. Bucknall, Mrs. Manville, Mrs. Herbert Lloyd, Mrs. Edwin de Lisle, Mr. John de Lisle, Lady Geraldine St. Lawrence, Mrs. Henry Edmunds, Captain and Mrs. Deasy, Mrs. Henry Walter, Miss Parker, Miss Evans, Miss Morris, the Duke of Newcastle, Count Moore, Miss Pilcher and her nieces the Misses M. and R. Pilcher, and Miss d'Esterre-Hughes.

Amongst the coming fixtures of the club are: June 7th—Meet in Buttersea Park at 3.30 p.m. June 28th—Meet at Lightwater,



Meet of the Herefordshire Automobile Club at Canon Froome Court, when Col. and Mrs. Hopton entertained about 70 members and their friends. Subsequently the cars proceeded to Malvern, Col. Hopton joining in the run. Several high-powered Wolseleys, Daimlers, Mercedes, and other well-known makes took part, and also one of the new 15-h.p. White steamers, whilst smaller powered cars were well represented by De Dions, Gladiators, Wolseleys, &c.



Herefordshire A.C. Meet. Another view of the cars which participated in this run.

Bagshot, by invitation of Lady Colville. June 30th—First day of run to France for the Gordon-Bennett Race. July 1st—Gymkhana at Ranelagh. July 8th—Meet at Charlwood Wood Park, Charlwood, by invitation of Mrs. Campbell.

North London A.C.—The opening run of this club took place on Saturday last from headquarters, the Fox Hotel, Palmer's Green, N., when sixteen cars and several motor cycles took part in an enjoyable run to the Red Lion Hotel at Hatfield, where fifty-seven members and friends sat down to a substantial repast. Following this, a short musical programme was carried through, Mr. A. W. Gamage genially occupying the chair.

The secretary, Mr. Charles Smith, in a brief statement, reported that notwithstanding that the club was only founded as recently as March last, it now numbered thirty-two active, and twelve honorary members. The following have already consented to become vice-presidents:—The Hon. Rupert Guinness, C.M.G., Dr. White-law, W. G. Rice, Esq., J.P., Walter Johnson, Esq., J.P., A. W. Gamage.

Mr. Percy Short has agreed to act as honorary solicitor to the club, and a strong committee, with Dr. North as its chairman, has been formed.

Berkshire and West Surrey A.C. Clubs.—A meet of the Berkshire and West Surrey Automobile Clubs took place on Saturday, May 27th, at Tangle Park, Guildford, where Mr. and Mrs. Wilson Noble entertained upwards of 70 visitors, about 25 cars arriving in the course of the afternoon. Among the members present were Lord and Lady Hawarden, General and Mrs. Kincaird, Messrs. F. Baring-Gould, Buttemer, Fletcher, King, Vogen, Werne, Williams, and Dr. Thorne-Thorne, Mr. and Mrs. Manville, &c.

Marine Motor Association.—Lieut. Mansfield Cumming, R. N., has been elected a member of the council, and Mr. John McIlwaine has been elected a member of the Association. The application of the new Marine Motor Club of Great Britain and Ireland [for affiliation has been accepted.



One of the petrol vehicles entered to compete for the Tourist Trophy in September next is a 13-17-h.p. "Dixi" Car. It is of a new type introduced this year, and differs somewhat from the "Dixi" Cars described by us last autumn. It has a pressed steel frame, to which the engine and the gear-box are, however, attached with a three-point suspension as before. The four cylinders have a bore and stroke of 95 and 100 mm., respectively, and the engine is provided with two alternative ignition systems, the one with a high-tension magneto, and the other with accumulators and a specially designed commutator that can be removed for inspection instantly. Ball bearings are employed in the three-speed gear-box, as well as in the hubs of the road wheels, and the car is of the live-axle-type. As seen in our illustration—where Captain Bennett is at the wheel—the standard body [has side entrances, is of handsome appearance, and affords comfortable accommodation for five persons.

PROVISION is being made both at the Doncaster Meeting, and was carried out during the present week at Epsom for the Derby Meeting, for the allaying of dust at the more frequented points with "Westrumite."

A PAPER, entitled "The Improvement of London Traffic," is to be read before the Society of Engineers, at the Royal United Service Institution, Whitehall, by Messrs. C. S. Meik, M.I.C.E., and W. Beer, A.M.I.C.E., on June 5th.

LAST week Professor Spooner, of the Polytechnic, took 200 students through the new Clement-Talbot works at North Kensington, where a tour of inspection was made under the guidance of the chief engineer, Mr. Garrard, and a series of lectures were given in each department.

A unique outing has been arranged for 12 midnight to-day, Saturday. A number of actors and actresses, at present engaged in musical comedy in London, are to meet outside the Walsingham Club, Coventry Street, Leicester Square, when a start will be made in motor cars to Maidenhead for the week-end. The procession will proceed to the Riviera Hotel, Maidenhead, which has been secured for the occasion, those taking a prominent part in the arrangements being Mr. Seymour Hicks, Mr. Lawrence Rea, and Mr. G. P. Huntley. At Maidenhead, photography will, of course, play a conspicuous part on Sunday, and the results on the biograph will be shown at the Alhambra on Monday evening.

MR. MOFFAT FORD has a good eye for the humorous effects which may be obtained from police courts. He has had excellent fun in these institutions before, and now, apropos of the Marquis of Queensberry's sensational application to the West London magistrate, Mr. Ford has appeared before Mr. Garrett, at the South Western Court, and asked his advice on the situation. "Should I," said Mr. Ford to the magistrate, "considering what has occurred, as I frequently motor along the Hammersmith Road, be justified if I see the noble Marquis waiting for me with a pistol (presumably loaded) in shooting him at sight?" Needless to say, Mr. Garrett scouted the idea, and also pointed out what must have been obvious to everybody, that Mr. Lane, the magistrate to whom the Marquis of Queensberry, applied, did not counsel his carrying a pistol, but only said (presumably with veiled satire) that he might carry a pistol *if he could get a licence*. Having elicited the information that in this country it is not permissible, whatever your danger, to shoot first, Mr. Moffat Ford "withdrew."

WE have so often had occasion to criticise adversely the proceedings of the Kingston Bench, that it is an agreeable change to find Mr. Frederic Coleman putting



Off the beaten track in Holland. The White Steam Car, the property of Mr. L. B. Goettsch, of Utrecht, in an out of the way spot in the land of dykes and ditches. This 15-h.p car is the one which Mr. Goettsch has been driving this week in the Holland Automobile Club's three days' endurance trial over a distance of 840 kilometres, starting from Amsterdam.

in a good word for them. Some time ago he was summoned for driving at the speed of 25 miles an hour. At the date the summons was returnable he had to be absent on the Continent on business, and he was fined £10 and 8s. 6d. costs during his absence. He subsequently wrote to the Bench admitting that he had exceeded the speed limit, but, in view of the excessive character of the fine, requesting that the case might be re-opened. This the Bench refused to do, but, in view of the explanation he offered of his non-attendance, they reduced his fine by £5.

IN our correspondence column appears a letter from Mr. Letts, of Messrs. Charles Jarrott and Letts, Limited, in connection with the Paul Meyan challenge to British cars in regard to reliability. In this, he points out the fact that Mr. Edge was unable to take up the challenge on behalf of Great Britain, owing to the first fight having been secured by Mr. Siddeley with his car. Mr. Letts suggests that a Napier car should meet a De Dietrich car through the offices of his firm. If the suggestion commends itself to Mr. Edge, nothing could be happier than to see Mr. S. F. Edge driving one of his own cars against his very old friend Mr. Charles Jarrott on his De Dietrich, a match which we think would create an enormous amount of interest on both sides of the Channel.

PUBLICATIONS RECEIVED.

"Continental" Handbook for Automobilists in Great Britain and Ireland. 1905 Edition. Continental Tyre and Rubber Co.
The British Motor Tourist's A.B.C. London: The British Motor Tourist's A.B.C. Company, 30, Fetter Lane. Price 1s. net.
The Empire's Cricketers. Part I. London: The Fine Art Society, Limited, and Dawbarn and Ward, Limited. Price 1s.



An electric car built for the King of Siam by the Carl Oppermann Electric Carriage Company on the lines of a petrol car.

THE effect of a generally-accepted fashion, in influencing taste in matters of design, is illustrated in automobilism quite as much as in spheres hitherto more directly monopolised by the fickle goddess. The latest result of this tendency is the electric vehicle of which we reproduce a photograph, this being an almost exact replica, as far as external appearance is concerned, of the lines which the general public have for some time come to associate with petrol cars. This six-seated car has been specially built to the order of H.M. the King of Siam by the Carl Oppermann Electric Carriage Company. The tonneau body, which is painted a brilliant red and is upholstered in morocco to match, has a Cape-cart hood, and has silver fittings. To complete its imposing appearance, the King's coat-of-arms is emblazoned in gold on each side as well as at the rear. The 6-h.p. motor is suspended in front, and this drives the live-rear-axle through a universally-jointed propeller-shaft and worm-gearing. The current is supplied by 44 accumulator cells that have a capacity of 180 ampère hours, these being contained in six boxes, placed partly beneath the bonnet and partly under the seats. The controller gives four speeds and a "reverse," ball-bearings are employed throughout the car, and a maximum speed of 17 miles an hour is obtained at a normal discharge rate of 32 ampères.

THE next Motor Union Inter-Club Meet is to take place at Harrogate, on June 24th, when it is hoped that even the big gathering of cars at Welbeck will be surpassed.

The Simms Safety Buffer.—

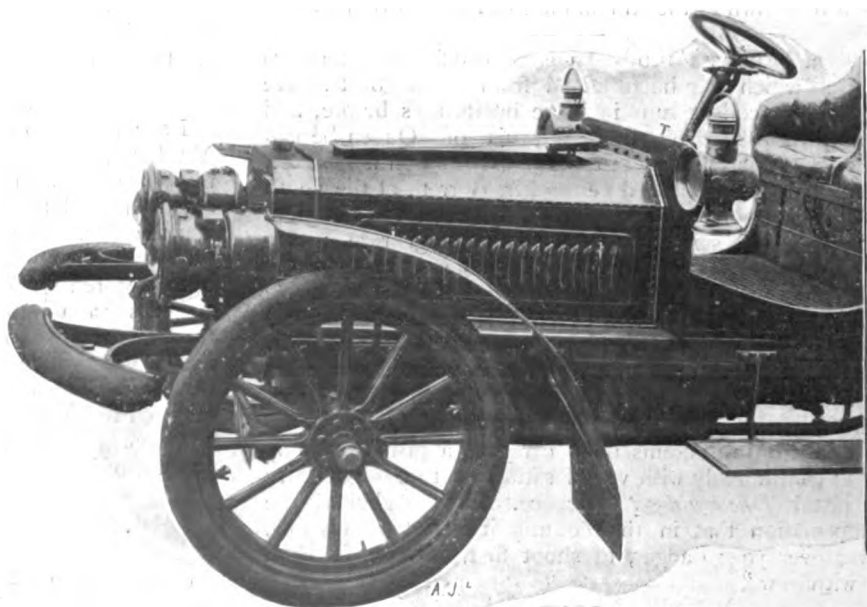
In order to render the consequences of a collision less disastrous, Mr. F. R. Simms has recently brought out a pneumatic buffer which may be attached to any car. The front of the buffer—which is constructed in halves in order not to make the starting-handle inaccessible—is virtually a pneumatic tyre. The rim on which the tyre is mounted is carried on curved leaf-springs which are bolted to the side members of the main frame.

The springs cause the outside end of the buffer to be particularly resilient, so that the shock of striking an object at that point is very largely absorbed, and, under favourable conditions, the object struck will be merely pushed aside unharmed. Thus Mr. F. R. Simms, in a demonstration which he gave last week at the Hotel Cecil, charged a milk-cart most successfully,

and a large post was also disposed of in a very business-like manner and without the least harm to the car. Another experiment, carried out on a man, was less convincing, probably on account of the volunteer victim's obvious nervousness, which, under the circumstances, was perhaps excusable.

There is no doubt that the results of many a collision would have been less serious had the car been fitted with some such device as this.

Forty kiloms. (24·85 miles) has been officially fixed as the maximum speed on roads outside towns in Italy. In towns 12 kiloms. (7·45 miles) per hour is the limit.



The Simms Pneumatic Buffer, which is intended as a protection in the event of a collision.

CORRESPONDENCE.

* * The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

RELIABILITY—FRANCE v. ENGLAND.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—Through the acceptance by Mr. Siddeley of the challenge thrown out by M. Paul Meyan, Mr. Edge is deprived of the opportunity he was apparently seeking for, viz., of running his Napier car against the De Dietrich. Obviously it would be unfair for M. Meyan to have two opponents to deal with, and, therefore, Mr. Edge withdrew in favour of Mr. Siddeley.

In order that Mr. Edge should not be disappointed in the test of his car, we would like to say that we are prepared to run another De Dietrich car against a Napier car, over the same route and under the same conditions as the Meyan-Siddeley trial, or any reasonable modification of the same, if Mr. Edge so wishes. The trial to take place after the Meyan-Siddeley trial.

Yours faithfully,

CHARLES JARROTT AND LETTS, LIMITED.
W. M. LETTS.



Wing-Flight.—Referring to our article on "Wing-Flight" last week, Dr. Hutchinson writes to point out that, by quoting the lift obtained as being at the rate of only 50 lbs. per horse-power, our statement is somewhat misleading, since the No. 1 model was only built to demonstrate preliminary principles. He goes on to say that the lift obtained with the No. 2 model, with its 3 to 3½-h.p. engine, was found to be about 230 lbs., although the machine was working near the ground, in eddying air, and was without its proper forward velocity. He also takes the opportunity of drawing attention to an obvious slip which crept into that article, on page 650, the right-hand column, at the commencement of the second paragraph, which begins: "Mr. Frost has," &c. The last word of that sentence should be "upwards," not "backwards."

ALDERMAN BANKS, the Mayor of Folkestone, it is announced, has offered £100 towards providing prizes in connection with the motor boat race from Boulogne to Folkestone and back, in July.

COMMERCIAL POINTS.

A 24-H.P. Wolseley car, with specially designed body of the Limousine type, has been ordered by Mr. Andrew Carnegie. The Wolseley Company have also secured a further large order for motor omnibuses for service in London. The Wolseley omnibuses, like the whole of their pleasure cars, are somewhat unique, from the fact that they are built throughout by the firm, including body-work.

The Rev. R. H. Simpson, of East Keal Rectory, Spilsby, has communicated a very satisfactory record to the Dunlop Pneumatic Tyre Company. Mr. Simpson, who bought his car on January 15th, 1904, did not have a puncture of any sort until May 16th of the present year, after he had run 2,800 miles. Mr. Simpson, in placing this fact on record, wrote to the Dunlop Company, saying, "I think in justice to your firm those who get such satisfaction out of their tyres as I have should let the makers know." Reading this, in contrast to the earlier days of motoring, makes it appear almost impossible that the time is so recent when motorists voted themselves fortunate if they only had one or two punctures per day.

Cost of Running a Car.—An interesting communication has been sent us by De Dion Bouton, Limited, which has been received by them from Mr. W. Pickard, of West Bank, Mansfield, in regard to the cost of running a 12-h.p. 1904 model De Dion Bouton car. Mr. Pickard writes as follows:—

"I have run my car during the past twelve months. I have kept a careful record of the miles run and also of the cost, which I have pleasure in tabulating below.

I may say the car has given me great pleasure and satisfaction in every way. We have had no stops of more than 5m. duration excepting for tyre troubles, and even here we are still running one of the original tyres that has never had a puncture, never been off the wheel, and only been blown up twice during the year.

Car brought home, April 29th, 1904.

	£	s.	d.
Repairs...	...	5	13 2
Oil (a 28 lb. tin still in stock) ...	...	4	10 3
Petrol (461 gals.) ...	...	23	9 0
New accumulators ...	...	2	2 0
Recharging accumulators ...	...	0	14 0
Tyres ...	...	35	4 9
		<u>£71</u>	<u>13 2</u>

Miles run, 7,528 = 2'284d. per mile."



The spread of automobilism in connection with various official functions is remarkable for the varieties of duties for which it is now being employed. A novel departure was made at Aldershot last week, when the King, after his inspection of the troops, unveiled a monument. A motor cycle "standard" bearer preceded the Royal parade, as seen in our photograph above.

NEW COMPANIES REGISTERED.

Lancaster Motor Association (Limited), 10, The Arcade, Lancaster. Capital, £250 in £1 shares. Object, to insure, buy, inspect, and maintain motors, &c. First directors: T. B. K. Thompson, J. Bland, A. G. Douthwaite, W. S. Green, T. Huntingdon, W. Knowles, and J. R. Nuttall.

Metropolitan Motor Cab and Carriage Company (Limited), Finsbury House, Blomfield Street, E.C.—Capital, £150,000 in 149,500 ordinary shares of £1 each and 10,000 deferred shares of 1s. each. Object, to acquire the business of the London Express Motor Service, Limited. First directors: Earl of Ranfurly, G.C.M.G., A. C. Riley, H. H. Swan, H. V. Remnant, and R. Laurence.

Motor-'Bus Company (Limited), 53, New Broad Street, E.C.—Capital, £100 in £1 shares.

Pytchley Autocar Company (Limited), Bradshaw Street, Northampton.—Capital, £5,000 in £1 shares (2,000 preference). First directors, Colonel C. E. Foster, A. N. Mobbs, and H. Mobbs.

NEW ISSUES.

Tangent Wheels (Limited).—The prospectus of this company was issued last week, the subscription lists closing on May 31st. The company has a share capital of £50,000, divided into 50,000 shares of £1 each, of which 33,000 were offered for subscription under the prospectus. The company has been mainly formed for taking over and working the Gare patent resilient motor wheels. The directors are Mr. J. C. T. Bush, Mr. T. Gare, and Mr. E. Heald.

The Metropolitan Motor Cab and Carriage Company (Limited).—This company has a capital of £150,000, divided into 149,500 ordinary shares of £1 each and 10,000 deferred shares of

1s. each. The prospectus issued last week, the lists closing on May 29th, invited subscriptions for 73,000 ordinary shares. The object set forth in the prospectus was the acquiring the business of the London Express Motor Service, Limited, formed in January, 1902. This latter company has been carrying out a series of experiments and trials with the object of procuring a suitable motor vehicle for public use on the London streets. The motor employed has been supplied by the Herald Motor Manufacturing Company, Limited, and the prospectus gives particulars of the actual working cost and takings of several of the motor cabs during the period of the experiments. The figures given are as follows:—

Takings.

One cab, 129 days, from June 1st to November 30th, 1904, £215 12s. 7d. (average, £1 13s. 5d. per day).

Two cabs, running respectively 64 and 56 days (together 120 days), from January 2nd to March 12th, 1905, £236 9s. 9d. (average, £1 19s. 5d. per vehicle per day).

Taking these figures, the estimated income of the company is worked out upon a basis of 30s. per vehicle per day for 313 days in the year, each vehicle being estimated to show an annual profit of £104 10s. after allowing for all expenses, including

Driver's wages and commission, storing, cleaning, and running repairs, petrol, &c., £215.

Tyre and other renewals, annual painting and contingencies, £70.

Annual depreciation (20 per cent. on cost), insurance, &c., £80.

An income on 150 vehicles is estimated upon this basis at £15,675. The number of licensed cabs at present in use in London is stated to be about 11,000. The promoters of the company receive payment for the property acquired by the new company (including two motor hansoms, and a landulette now running), £2,000 in cash, 2,000 fully paid ordinary shares, and 2,500 deferred shares. Of this purchase price, £2,925 represents goodwill.

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, Temple Bar, London.

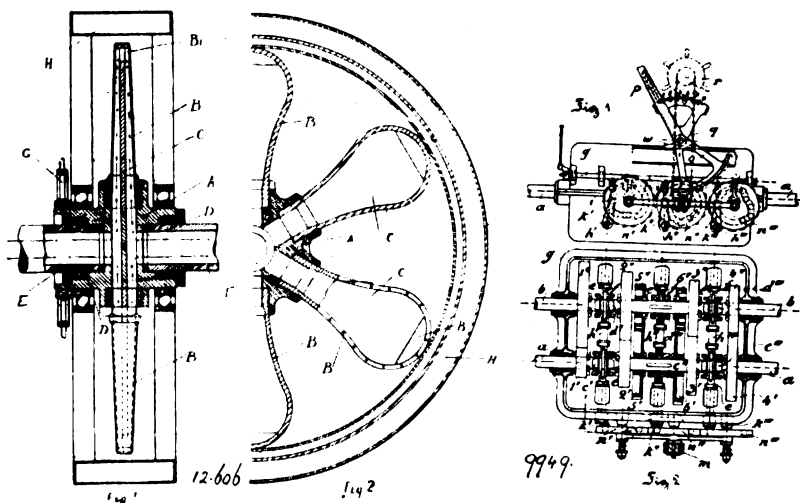
The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification

12608. 3rd June, 1904. An Improved Method of Heating or Cooling Fluids. W. H. W. Proctor, St. Patrick's Road, and W. Morgan, Paradise Street, both of Coventry. This invention relates to a method of heating or cooling fluids by other fluids of a different temperature, and has for its object to provide simple and efficient means for effecting the same. There are two figures. Fig. 1 is a sectional elevation in an axial plane, and Fig. 2 is a half-section at right angles to Fig. 1. The hub, A, of the fan is mounted on ball-bearings, and is formed with passages communicating with the hollow fan blades, B. The hollow fan-blades are divided by a partition, C, which extends across the hub and throughout the length of each blade. The hub is provided with packings, D, interposed between the rotating parts and the stationary parts, the stationary parts being the pipes, E and F. The pipe, E, is the inlet pipe and the pipe, F, the outlet. On the hub is attached a chain-sprocket, G. A water tank, H, is fitted round the fan. When the fan is rotated water is pumped in through the pipe, E, and flows in the direction of the arrows up the blades over the

passage, B', at the ends of the blades and returns to the hub to flow out through the pipe, F. May 11th, 1905.

9949. 30th April, 1904. Change Speed Gear, more particularly for use with Motor Cars. Eugen Soller, 43, Klarastrasse, Basel, Switzerland. Date under International Convention, 1st May, 1903. The arrangement of this gear comprises a number of spur wheels loosely mounted on the driving and driven shafts, and capable of being secured to them by means of adjustable clutches. The corresponding coupling clutches or sleeves on the driving spindle and on the driven spindle are actuated by means of cranks engaging with cam grooves of a cam, of which at least half of each groove is concentric, the non-concentric portion being partly formed as a projecting and partly as a re-entering angle. The portions of the grooves in separate curves are so arranged that only one crank is engaged at a time, and the pair of the clutches co-operating with the crank, so that during a complete revolution of the cam all the cranks, and, therefore, all the clutches are operated in turn. There are six figures. Fig. 1 is an eleva-

tion of the box of gear and Fig. 2 is a sectional plan. In bearings in the walls of the casing or box, g, are mounted two parallel shafts, the driving, a, and the driven, b. On each of these two shafts are mounted loosely six spur wheels of varying sizes, the spur wheel of one shaft being always in engagement with that of the other shaft having the same index; that is to say, the wheel, a', engages with a' with 5', and so on. The hubs of all the twelve wheels are provided on one side with projections forming parts of clutches, the projections being on one wheel on the right-hand side and on the next one on the same shaft on the left-hand side, on the third one again on the right-hand side, and so on. The other side of the hub is plain. Between the projections of each two adjoining spur wheels are mounted clutches, c', c'', c''', and d', d'', d''', provided with corresponding projections on both sides, and mounted on the shaft, so that they are capable of longitudinal movement on it. Each clutch is engaged by a fork, f, pivoted on two arms, e. The clutches, c' and d', are secured to a', so that the corresponding clutches are thus operated simultaneously. The coupling clutches, c, owing to their longer projections, engage with one or other of the spur wheels slightly earlier than the clutches, d. The cranks, k', k'', k''', are provided near their free ends with roller-carrying pins, i. The cranks, k, are on the spindles, h. The rollers engage in grooves of toothed cams, n', n'', n''', of the same size which are always in engagement. Two-thirds of the cam grooves are circular. In one-sixth of the circumference they form a projecting angle, and in the remaining sixth a re-entering angle. The three cams are so arranged relatively to the grooves, pins and clutches that during a complete revolution all these three cranks are in turn moved, so that the corresponding pairs of clutches are shifted in turn, and only one clutch on the shaft, a, and one on the shaft, b, are operated at one time. To shift from X, a high to a lower speed, say, from the second speed to the fifth, the three cam discs are moved longitudinally on their journals. An alternative method of the driving of the cam discs is effected by means of a hand wheel, r, and a chain, q, fitted to the sprocket-wheel mounted on the spindle of the cam disc, n'', but the method usually adopted is that of the lever, p, and movable quadrant, o, held by means of a tooth on the lever, p, engaging teeth, 1, 2, 3, 4, 5, 6 on the fixed quadrant, w. The ratio between the toothed quadrant, o, and the toothed wheel, w, is calculated, so that when the hand-lever, p, is turned through a corresponding distance the cams are turned through an angle of 60 deg. May 11th, 1905.



The Automotor Journal, June 10th, 1905.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

Offices: 44, St. Martin's Lane, London, W.C.

No. 231. (No. 23, Vol. X.)

JUNE 10TH, 1905.

[Registered at the G.P.O.
as a Newspaper.]

[Weekly, Price 3d.
Post Free, 8d.]



ISLE OF MAN ELIMINATING TRIALS.—Few visitors to the Isle of Man have failed to notice the remarkable sight, which can be witnessed at almost all points on the Island, of flocks of sea-gulls following the newly turned up earth of the plough. The sight is a particularly fascinating one, and the keenness and perseverance with which these graceful birds hover over the furrows, instantly picking up every atom of food which comes to light, provide an ever-changing demonstration of the marvellously varied movements of which sea-bird flight is made up.

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NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C., by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

1905.		
June 10 ...	*South Harting Hill-Climb (Members A.C.G.B.I.).	
June 10 ...	London-Edinburgh (Motor Cycling Club).	
June 12 ...	Filey Sands Races (Yorkshire A.C.).	
June 14 ...	Bexhill Race Meeting.	
June 17 ...	Car Trials and Races, &c., at Welbeck (Notts A.C.).	
June 24 ...	100 Miles Passenger Trial (Motor Cycling Club).	
June 24 ...	Motor Union Inter-Club Meet, Harrogate.	
June 29 ...	Foster Cup for Non-Stop Run (Notts A.C.).	
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).	
July 1 ...	Padley Wood Hill Climb (Sheffield A.C.).	
July 8 ...	Auto Cycle Club Consumption Trial.	
July 8 ...	Notts A.C. Hill Climb.	
July 12 ...	*Hill-Climb (Henry Edmunds Trophy).	
July 19-22 ...	*Brighton Speed Races.	
July 27-28-29 ...	*Blackpool Motor Meeting.	
July ...	24 Hours Run (Motor Cycling Club).	
Aug. 2-3 ...	*Motor Boat Trials (Southampton).	
Aug. 11 or 18 ...	*Quarterly 100 Miles Trials.	
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.	
Aug. 26 ...	Inter-Team Trial (Motor Cycling Club).	
Sept. 2 ...	Skegness Races on Sands (Notts A.C.).	
Sept. 9 ...	Brown Cup (Motor Cycling Club).	
Sept. 12 ...	Auto Cycle Club Race Meeting.	
Sept. 14 ...	*Tourist Trophy (Isle of Man).	
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).	
Sept. 20, Oct. 24 ...	*Van Trials.	
Sept. 23 ...	Scottish A.C. Hill Climb.	
Oct. 4 ...	*Speed Trials.	
Oct. 7 ...	Scottish A.C. 100 Miles Run.	
Oct. 14 ...	Scottish A.C. Anniversary Run (Ayr).	
Nov. 10 or 17 ...	*Quarterly 100 Miles Trials.	
Nov. 17-25 ...	Society of Motor Manufacturers and Traders Exhibition at Olympia.	

Foreign Events (Trials, Races, &c.).

1905.	
June 16 ...	French Selection Race for G.B.
June 25 ...	International Motor Cycle Cup.
June 20-28 ...	Aix-les-Bains Week.

* Automobile Club of Great Britain and Ireland Events and Papers

July 1 ...	Boulogne-Cape Gris-Nez (Motor Boats).
July 5 ...	Gordon-Bennett Race.
July 9-16 ...	Ostende Automobile Meeting.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Boulogne-Folkestone (Motor Boats).
July 16 ...	Mont Ceniz Hill Climb.
July 20-26 ...	Paris to the Sea (<i>Journal de L'Automobile</i>).
July 27-Aug. 8 ...	Paris Industrial Vehicles Trials (A.C. France).
July 28 ...	Gaston Menier Cup (Motor Boats).
July 31 ...	Anthony Drexel Cup (Motor Boats).
Aug. 6-7 ...	Circuit des Ardennes.
Aug. 10-16 ...	Herkomer and Bleichroder Races.
Aug. 12 ...	International Cup for Motor Boats.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Tri-Car Competition (<i>L'Auto</i>).
Sept. ...	Vincenzo-Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.
Sept. ...	Tourist Car Trial (A. C. de France).
Sept. 3-10 ...	Royan Meeting.
Sept. 3-10 ...	Spa Automobile Club.
Sept. 11 ...	British International Cup (Motor Boats Arcachon).
Sept. 12-14 ...	Lake Lucerne Motor Boat Meeting.
Oct. ...	Vanderbilt Cup.
Oct. 1 ...	Chateau Thierry Hill Climb.
Oct. 15 ...	Gaillon Hill Climb.

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BERLIN, Ilges, Passage Unter den Linden, and Railway Bookstall.	
BERNE, Schmid & Francke.	
CARLSBAD, Hoffmann & Epstein, Alte Wiese.	

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PASSING EVENTS.

A Matter of Interpretation.

THE framers of the Motor Car Act of 1903 really did desire to consult the interests of motor car manufacturers to a certain extent, much as some people, not realising to what an extent the measure was knocked about in Parliament and how it has been interpreted since, may be disposed to doubt it. And with this intention they introduced into the Act sub-clause b of Section 2. This sub-clause relates to identification marks for the use of manufacturers, by means of which a manufacturer can by a single yearly payment have a general mark which he can use on all cars he is offering for sale prior to purchase, one of the objects no doubt being to enable him to give trial runs on his cars without going to the expense of regularly registering each one of them. The clause in question is as follows:—

"The council of any county or county borough in which the business premises of any manufacturer of or dealer in motor cars are situated, may, on payment of such annual fee, not exceeding £3, as the council require, assign to that manufacturer or dealer a general identification mark which may be used for any car on trial after completion, or on trial by an intending purchaser, and a person shall not be liable to a penalty under this section while so using the car if the mark so assigned is fixed upon the car in the manner required by the council in accordance with regulations of the Local Government Board made under this Act."

This has generally been understood to cover the case of manufacturers testing finished chassis with the usual "egg-box and petrol tank" temporary seats mounted on the top. Every manufacturer of course gives his finished chassis a more or less prolonged amount of testing in this way before putting on the body it is designed to accommodate, finishing it off, and upholstering it in the usual attractive manner. Now, however, the police seem to be taking a different view of the section, and a leading London garage have pointed out to us that they have been informed that the use of the red and white general identification mark on finished chassis will in future be made the ground of prosecution. Now this is a decidedly serious matter. No manufacturer is going to test and tune up a chassis with a finished body on it, and if this sub-clause of the Act is to be interpreted as applying only to finished cars, a large part of what was obviously intended by the framers of the Bill to be its principal usefulness will be eliminated. It is plain that the interpretation that the police are attempting to adopt is against the intention of the Act, and is merely based on the most literal rendering of the phraseology to the disadvantage of manufacturers. After all it is entirely a question of what is the legitimate meaning to be attached to the word "finished," but perhaps it would be worth while if the Motor Union or the Club would take the matter up and assist in a test case being brought into the Divisional Court, so that a commonsense interpretation may be put upon the passage. In the meantime perhaps they will be safer if they send out their chassis with rough bodies painted in workshop grey. That certainly ought to constitute a sufficient degree of completion to entitle to the use of the general identification mark.

A Difference in Conditions.

THE motor van postal service in the Transvaal and Cape Colony, of the organisation of which we informed our readers at the time, would not appear to have given all the satisfaction that might have been hoped for. The Cape Colony Post Office, however, is not discouraged,

and has been consulting the home authorities on the subject. It is satisfactory to learn that Mr. W. Roach, Director of the Imperial Motor Mail Department, is thoroughly satisfied with the experiments his department has carried out in regard to the application of motor transport for mails at home. Results are all the home Post Office look to, and, with the results, they are content. They do not propose in any way to build motor vans for themselves, but are so satisfied with what the contractors have done for them in this respect as to be willing to rely on them in future. The failure in South Africa is to be attributed no doubt to the rough tracks which do duty for roads in the Colony. The effect is bad enough on light passenger cars, but it, of course, becomes much more serious when heavier vehicles, of the type required by the Post Office, are joggled about on them. Motor car builders may ultimately get over these difficulties, and probably will, but in the meantime the natural direction for progress to take would be for the roads in South Africa to be to some extent approximated to those in more civilised countries.

The Dust of Debate.

THE long threatened hurricane has come at last. It has passed without doing serious damage, and on the whole has cleared the air. We refer of course to the outburst which took place in the House of Commons on Thursday last when the supply stage of proceedings was reached. Needless to say, it was Mr. Wason who "rode the whirlwind and (to some extent) directed the storm." He opened the proceedings by hurling a thunderbolt at the head of Mr. Long—a thunderbolt bristling with that most deadly lightning in the Parliamentary armoury—the suggestion of a "broken pledge." "Mr. Long had broken the pledges he solemnly gave to Parliament and the community in introducing the Motor Car Bill." The thunderbolt, however, needless to say, glanced back from the shield of solid fact which Mr. Long raised in his defence, and more or less took Mr. Wason amidstships. There was of course no broken pledge, for Mr. Long had never proposed or suggested giving local authorities unfettered control, and no such suggestion was contained in the original draft of the Bill. Mr. Wason was supported by Mr. Soares, and with him the floodgates of anti-motorist "eloquence" (?) were opened even more widely than in the case of Mr. Wason. "Automobilism was a case of 'hell let loose.' Cottagers and children could no longer play in the roadway" (for which the roadway was not made), and all the rest of it. "We must have some drastic powers," and so on—a position which was supported by other more or less obscure members, who elicited cheers ever and anon by heartrending descriptions of how hedges were obliterated by the dust of motor cars, and even the glass of greenhouses had been rendered useless, as the coating of dust with which the motor cars supplied them effectually barred out the sun! There is evidently something in the anti-motorist attitude which deprives its victims of the amount of humour with which the average Englishman is usually endowed.

Fortunately the other side of the question was in able hands, and no more good-tempered, moderate, and peace-making speech was ever uttered than that in which the Hon. Arthur Stanley, chairman of the Automobile Club, attempted to throw oil on the troubled waters. He did well to point out the gross exaggeration to which the daily Press has regularly lent itself, and wisely drew attention to the classical instance, cited in

all good faith by the Earl of Camperdown a couple of years ago, of the motorist who came to the assistance of a lady injured by a horse, an incident which was described in the Press as "another shocking motor car accident." He pointed out, too, that high-speed driving has been in many cases, at any rate, the result of reckless police evidence. As an instance in point, he mentioned a case in which a speed indicator of whose *bonâ fides* no doubt whatever could be entertained, showed a car to be going at 14 miles an hour through a police trap, the police subsequently swearing that it was going at 43. As was to be expected, Mr. Stanley is more denunciatory of the reckless driver than the bitterest anti-automobilist, and both he and the Automobile Club are anxious to see the nuisance stamped out, even if it be by further and more drastic legislation, provided adequate guarantees of justice are provided. The Government reply was of course made by Mr. Gerald Balfour, who now occupies the position so ably filled for a lengthy period by Mr. Long. Naturally he recognised that the old maximum speed limit of 14 miles an hour could never be returned to (though some anti-motorists seemed to hope it might be even reduced). "The subject deserved the most careful consideration from every point of view," and he wound up by making the very useful suggestion that either a Royal or Departmental Commission should be appointed to enquire into the working of the Act, of course with a view to considering the alterations to be made when it comes up for review.

Automobilists have no reason to be dissatisfied with the general tenour of the debate. There was plenty of sound and fury, a cataract of "adjectives," a bombardment of epithets, and a general haze of mixed metaphor, as is usual when a special occasion gives members not accustomed to debate an opportunity of taking the floor. But, in general, it was an exhibition of the same old prejudice, the same old "arguments," and the same old phalanx of anti-motorists who do not seem to have added to their numbers a single convert. Like the Bourbons, they have forgotten nothing, and have learnt nothing either. There was, perhaps, amongst the very few, rather more bitterness in the anti-motorist attitude than two years ago, but not much, and this is, perhaps, to be explained mostly by the recent dry weather with its enormous crop of dust, the very considerable increase in the number of motor cars using our roads, and in the certain number of accidents, regrettable in a high degree, but after all far from numerous considering the number of automobiles in use, of which more than enough has been made in the daily papers.

The Automobile Club, the Motor Union, and all the associations and clubs affiliated or connected with them, have so sternly set their faces against inconsiderate driving in any shape or form, and are doing such good work in tackling the dust nuisance both by experiments on the shape of bodies and in methods for rendering roads dustless, that the former of these nuisances will soon be eliminated and the latter very largely abated before a long period has elapsed. When this happens, the popular irritation, which—added to a love of notoriety—has been the main driving power behind the anti-automobilist "specialists" in the House of Commons, will disappear.

A Really Useful Suggestion.

THE appointment of a Commission, whether a Royal Commission or a Departmental one, has often been

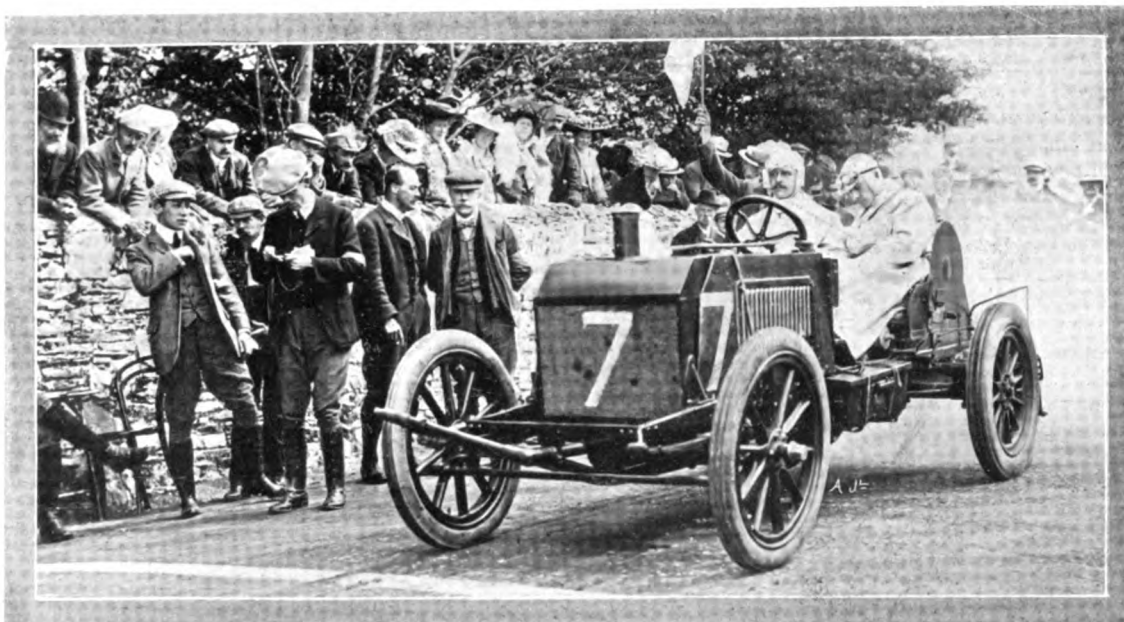
looked upon as a polite or diplomatic method of shelving a question, and a cynic once suggested that the British method of Government was by "popular suffrage tempered by Royal Commissions." But there are occasions where Commissions have performed most valuable service, and we are quite convinced that the appointment of an adequate committee now, to consider and make proposals in regard to the automobile question would be of the greatest value. The last Act unquestionably suffered from the subject not having been thoroughly thrashed out from all the main points of view before it came up for discussion in Parliament. And this fact is responsible for a great many of the anomalies which it contains. Amendments were proposed and accepted of which the full force and effect was not at the time realised. The appointment of a Commission this year would enable every aspect of the problem to be well and thoroughly discussed before the next Bill is even drafted, while nothing goes further to assuage animosity than frank and businesslike discussion. The automobile movement has everything to gain from full and free discussion, and the sooner that discussion commences, and the more thorough it can be made, the better it will be.

Mistaken Politics.

WHILE most of the daily papers have appraised the debate, to which we have referred above, at its true value, as a serio-comic interlude in Parliamentary business—a judicious lifting of the safety valve by which a little of the anti-motorist high pressure steam could be harmlessly allowed to escape—we are somewhat concerned to notice that the leading Liberal organ has made a decided attempt to convert the motor car question into a political party question. Similar attempts have been made by some of the lighter skirmishers of the Liberal Press before. But they are by nature irresponsible. It is a different matter when the leading Liberal paper disingenuously adopts the same line. We refer, of course, to an article in the *Daily News* in which Mr. Wason's unwarrantable charge against Mr. Long was repeated and amplified. This is what the *Daily News* says:—"He (that is Mr. Long) had refused to insert a (speed) limit in the Act itself, leaving power to the local authorities to establish a limit, and, having got the Act through on that understanding, he proceeded to render the clause, on which the absence of a time limit was agreed upon, practically null and void." No more absolutely baseless, false statement of fact has ever appeared in a daily paper of repute than this. In the original draft of the Bill introduced by Lord Balfour of Burleigh in the House of Lords on July 7th, 1903, occurs the clause:—

"Section 4 of the principal Act (which relates to the speed of motor cars) is hereby repealed, except as respects any special limits or special place to which that section is applied by regulation made by the Local Government Board with a view to the safety of the public on the application of the council of any county or county borough in which the special limits or place are situated."

In the measure, as it ultimately became law, Section 9—the corresponding passage—is almost word for word the same. Before attempting to make what is purely a social and industrial question into a political one, and to make political capital out of it, the *Daily News* might, one would have thought, have taken the trouble to compare these two passages.



ISLE OF MAN ELIMINATING TRIALS.—Mr. Clifford Earp (first British representative), on the 80-h.p. Napier, one second before the flag dropped. It will be noticed that Mr. Earp's wheels are well inside the starting line.



En route to Ballasalla. The Hon. C. S. Rolls on No. 11 (90-h.p. Wolseley).

Photos by Mr. Frederic Coleman.
Blanchi on the second selected Wolseley Car.

ISLE OF MAN ELIMINATING TRIALS.

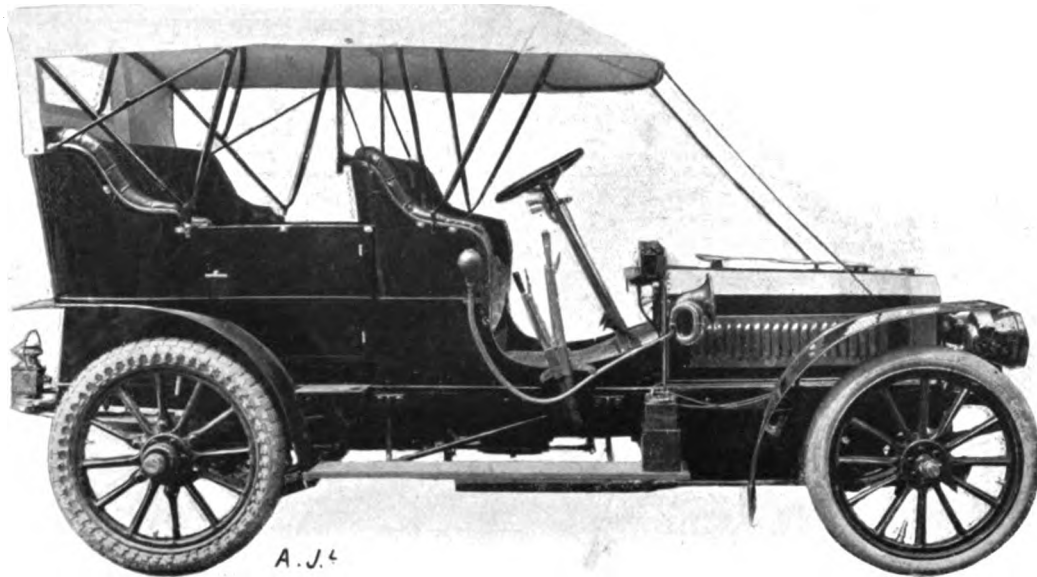


Mr. A. E. Macdonald travelling at about 80 miles per hour over the 2½ mile test stretch before reaching Foxdale.

Photos by Mr. Frederic Coleman.
Blanchi speeding over the same road on his Wolseley Car.

ISLE OF MAN ELIMINATING TRIALS.

THE 1905 SIMMS-WELBECK CARS.—PART I.



Major Shaw's 20-24-h.p. Simms Car, fitted with side entrance body and Cape cart hood.

Few of the English pioneers in the motor industry are better known than Mr. F. R. Simms, the chairman and chief engineer of the Simms Manufacturing Company—the makers of the Simms-Welbeck petrol cars; but his name is, perhaps, better known in connection with the Simms-Bosch magnetos, which have steadily increased in popularity and have achieved world-wide celebrity. The Simms-Welbeck cars are British-built throughout, although the company's factory at Kilburn is of insufficient size to enable all the parts to be manufactured on the premises. The design has been essentially directed towards producing a vehicle which can be profitably sold to the public at a moderate price, without having recourse to inferior materials, or to the omission of refinements which experience has shown to be useful and not superfluous.

Radical innovations naturally become less and less frequent as the ideas of engineers become more settled, and although no two chassis, constructed by different makers, are identical, yet in many cases they differ only in the details of design. In the Simms chassis, which are all of the live-axle type, the special features are the carburettor, which is of the "automatic" type, and the clutch-operating mechanism, which has a dash-pot to "soften" the action of the clutch-cone. Both high and low-tension-ignition systems are provided, and the chassis has been designed for the use of plain bearings throughout. The lay-shaft in the gear-box can remain stationary on the top speed, but the least usual feature is the inter-connection of the sprag with the change-speed lever in such a way that the "reverse" gear cannot be used while the sprag remains in contact with the ground.

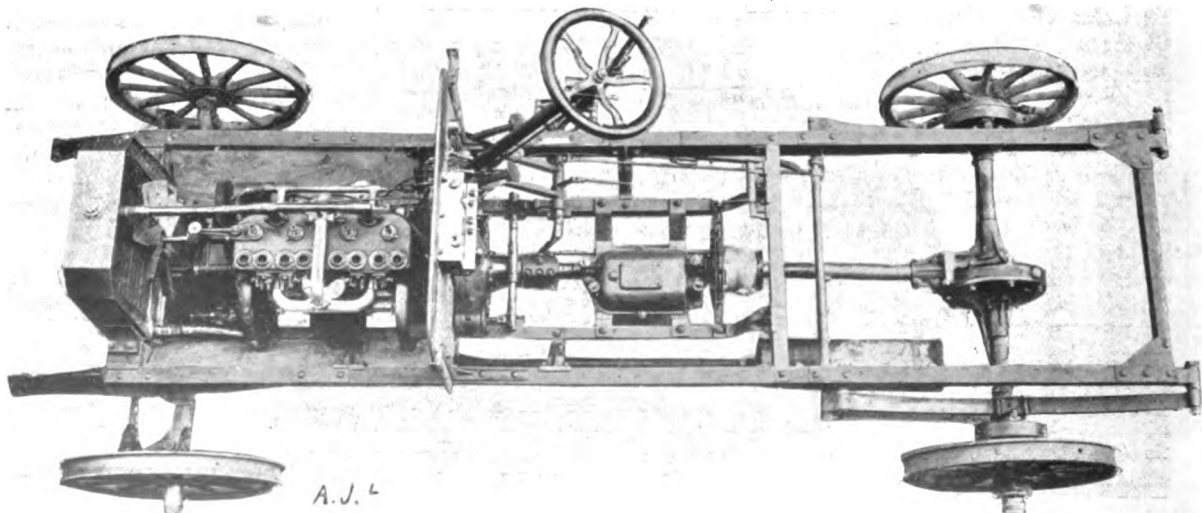


Fig. 1.—View from above of the 20-24-h.p. Simms Chassis, showing the arrangement of the underframe which supports the engine and gear-box.

Three different sizes are included in the complete list of cars, these having engines of 12-15-h.p., 20-24-h.p., and 26-30-h.p. respectively. All the engines are of the 4-cylinder type, but the cylinders of the smallest are cast separately, while those of the two larger engines

two Γ iron intermediate cross members, and has a hollow cast-iron member which passes underneath

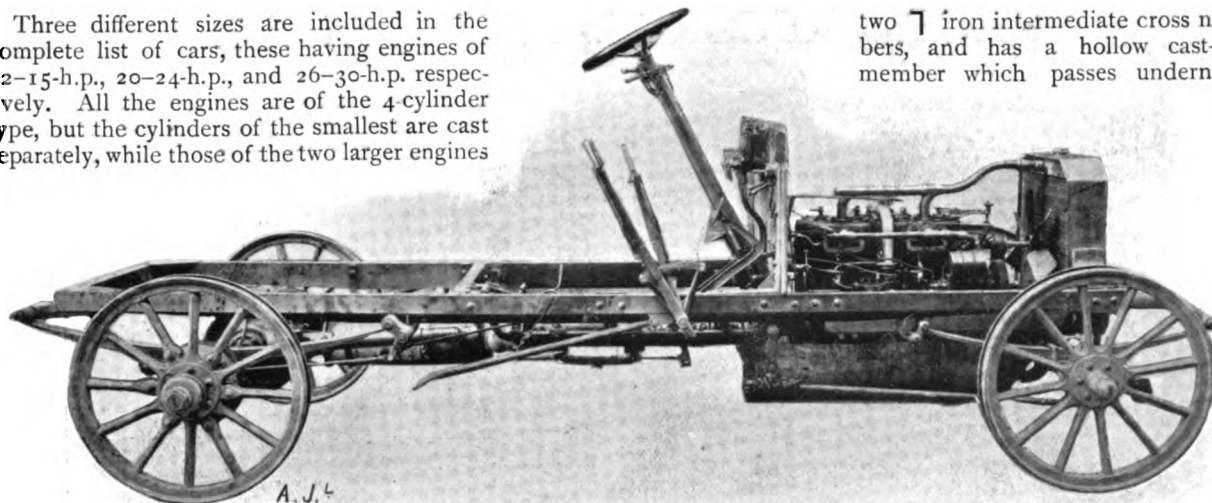


Fig. 2.—View from the side of the 20-24-h.p. Simms Chassis.

are cast in pairs. In a few other details, too, the smallest engine differs from the larger sizes, but the chassis are similar for all types; the photographs and description which we now give of the 20-24-h.p. vehicle will, therefore, apply in the main to the other sizes also. The chassis is seen from above, and from the side, in Figs. 1 and 2, respectively.

The frame is constructed of armoured wood (ash), has an armoured wood transverse member at the rear, which is strengthened by gusset-plates at the corners, has

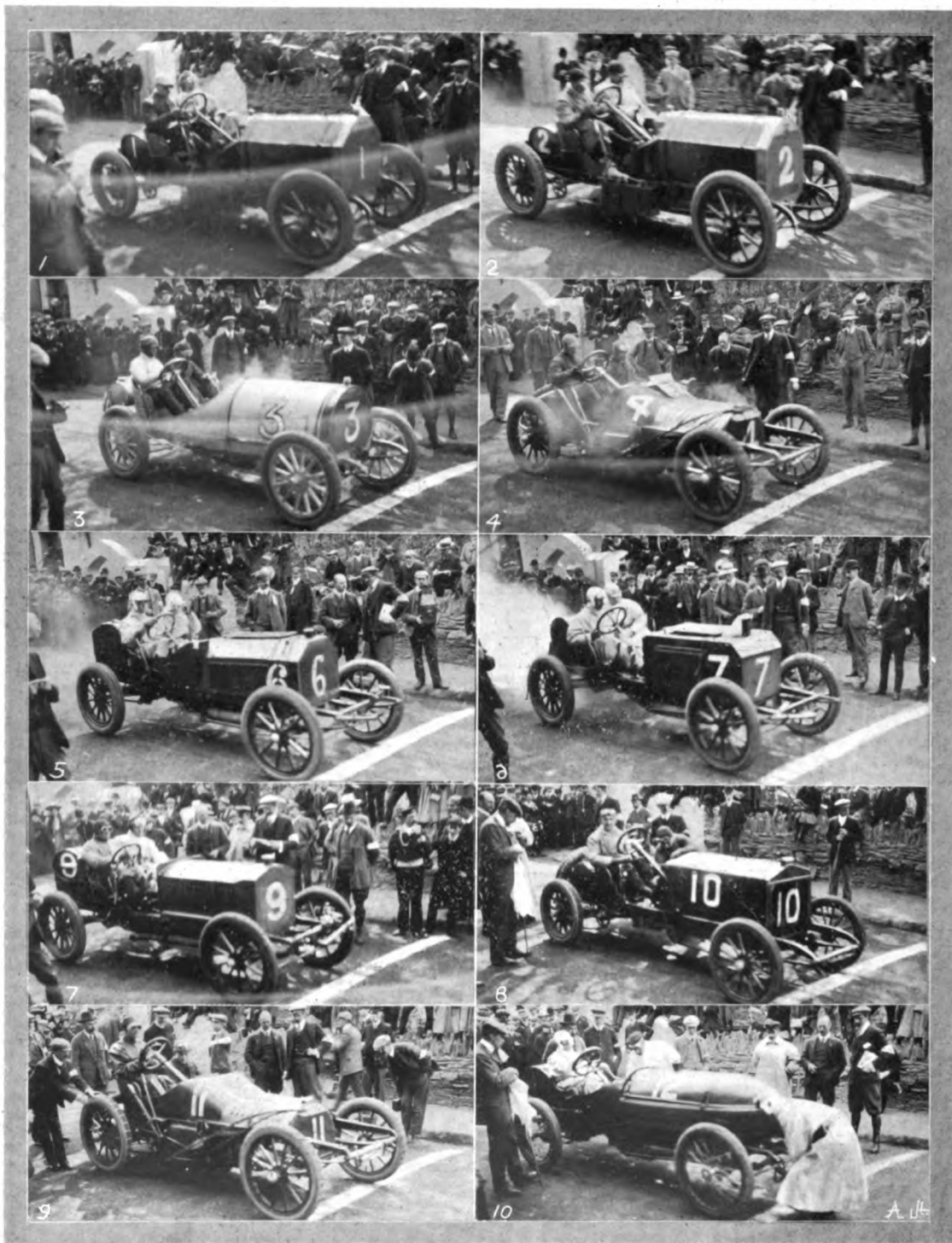
the radiator in front. The engine and gear-box are carried on an Γ underframe, which terminates at one of the intermediate cross members as seen in Fig. 1. It will be noticed that the dumb-irons supporting the ends of the rear springs are exceptionally short, and that the shackles are fitted in front instead of behind, as is more usual in those cars which do not employ radius-rods for tying the back axle to the frame. The front axle is of tubular section, the steering-gear is of the worm and sector type, and the tie-rod connecting the steering-knuckles lies in front.

(To be continued.)



ISLE OF MAN ELIMINATING TRIALS.—Some officials and "others" at the starting line, amongst whom a number of well-known motorists will be recognised.

RACES, RECORDS, AND TRIALS.

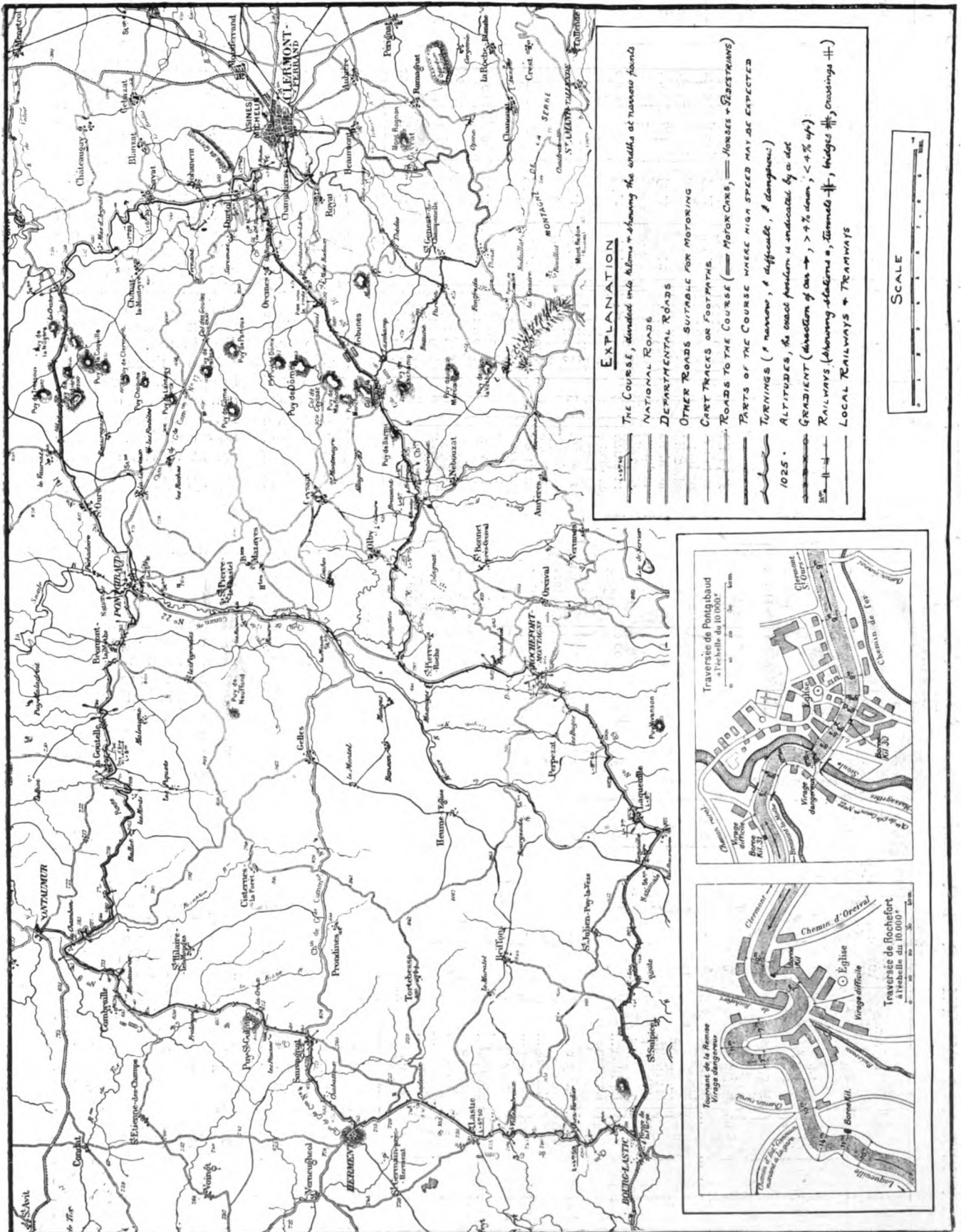


Photos by Mr. Frederic Coleman.

ISLE OF MAN ELIMINATING TRIALS.—The whole of the competitors at the starting line seen from the off side. 1. Mr. H. G. Goodwin (70-h.p. Star), 2. Mr. F. R. Goodwin (70-h.p. Star), 3. Mr. A. L. Guinness (90-h.p. Darracq), 4. Mr. C. Bianchi (90-h.p. Wolseley), 5. Mr. Cecil Edge (80-h.p. Napier), 6. Mr. Clifford Earp (80-h.p. Napier), 7. Mr. J. Hargreaves, M.F.H. (80-h.p. Napier), 8. Mr. Sidney Girling (100-h.p. Siddeley), 9. Hon. C. S. Rolls (90-h.p. Wolseley), 10. Mr. A. E. Macdonald (90-h.p. Napier).

Map of the Auvergne Circuit for the Race.—We reproduce on the opposite page the excellent map of the course to which we referred last week. The original,

which is on a larger scale and takes in somewhat more of the adjoining country, is printed in several colours, and is issued by Michelin et Cie., whose famous tyre factory is



GORDON-BENNETT CUP RACE.—Map of the Auvergne Circuit, reproduced, by permission, from a coloured map issued by Messrs. Michelin and Co., of motor tyre fame. This map should prove of considerable assistance to visitors next week upon the occasion of the French Eliminating Trials, and on July 5th, when the Race itself is run.

PARTICULARS OF THE RACERS ENTERED FOR THE FRENCH ELIMINATING TRIALS FOR THE GORDON-BENNETT RACE.

No.	Make.	Driver.	Described in AUTOMOTOR	Engine.			Ignition.	Transmission.	Tyres.	Wheel-Base.	Track.	Clutch.	Radiator.
				H.P.	Cyls.	Bore.	Stroke.	R.P.M.					
1	Richard-Brasier	Théry	page			mm.							
11		Cailliois	441	90	4 prs.	160	140	1,200	L.-T. magneto			Leather cone	Tubular.
21		Stead											
2	Renault	Siz	—	90	4 prs.	150	150	1,300	H.-T. mag., accumulators			Leather cone	Tubular.
12		Edmond											
22		Berlin											
3	C.G.V.	Girardot	—	130	4 sep.	160	160	1,200	H.-T. mag., accumulators			Leather cone	Tubular.
4	Clément-Bayard	A. Clément	485	120	4	160	160	1,200	—			Disc	Honeycomb.
14		Hanriot											
24		Villmain											
5	Hotchkiss	A. Fournier	571	120	4 prs.	185	160	1,100	L.-T. magneto			Leather cone	Honeycomb.
15		Le Blon											
25		Laverne											
6	Automoto	Lampertot	—	90	4	170	150	1,200	Magneto, accumulators			Metal cone	—
7	De Dietrich	Gabriel	—	120	4 prs.	190	150	1,200	L.-T. magneto			Metal cone	Honeycomb.
17		Rougier											
27		Duray											
8	Darracq	Hénery	531	85	4 prs.	150	140	1,200	H.-T. magneto			Leather cone	—
18		Wagner											
28		De la Toulloubre											
9	Panhard	Heath	441	120	4 sep.	170	170	1,100	H.-T. mag., accumulators			Disc	Honeycomb.
19		Toste											
29		Farman											
10	Gobron-Brillié	Rigolly	—	110	4 prs.	120	220	1,000	Accumulators			Leather cone	—

Special Features.

- 2, 12, and 22.—Frame below axles. Copper jackets per pair cylinders. Special design of clutch, the outer member having inwardly-projecting springs, formed by cutting slots through it, so that the leather-faced inner member comes into contact with them first.
- 3.—Duplicate ignition-plugs. One radiator fixed against dash and another in front, below bonnet. Curved horn plates with rearwardly projecting leaf springs for the back axle.
- 5, 15, and 25.—Special design of clutch. Axis of cylinders set tangentially to crank-shaft. Ball-bearings on crank-shaft.
- 8, 18, and 28.—Cars only weigh 750 kilograms, each. Wire wheels. Gear-box on back-axle.
- 9, 19, 29.—Steel cylinders with copper jackets.
- 10.—Tubular frame, four cylinders, and eight pistons.

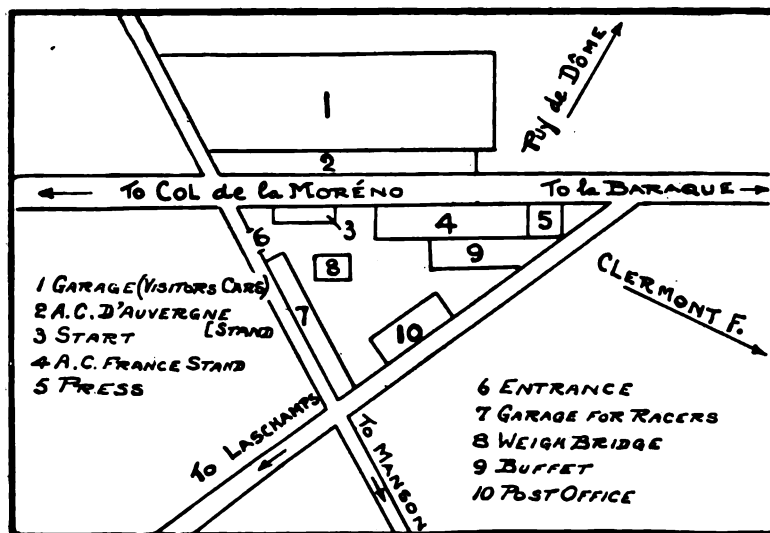
situated at Clermont Ferrand—the most important town in the Auvergne district.

The execution is in every way excellent, and an enormous amount of information is included, without at the same time rendering the printing indistinct.

As we pointed out last week, a copy of the map can be obtained, for the mere cost of postage, from Messrs. Michelin and Co.'s London Office, Sussex Place, South Kensington.

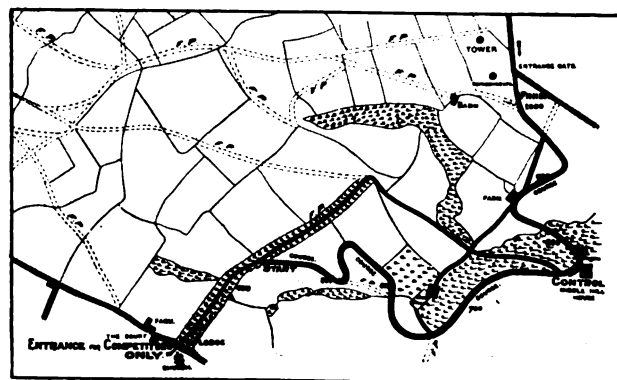
The three special bridges which are being constructed on the Auvergne course are now complete. These are at Volvic, a second one at Laqueuille and a third at Vauriat. The trials of the whole of these bridges were arranged for yesterday (Friday), so that they might be thoroughly tested to ensure there being no likelihood of an accident during the race. The manufacturers whose cars are entered in the Eliminating Trials were invited by the Auvergne A.C. to send their racers for this purpose.

A special notification has been issued by the Auvergne A.C. setting forth an interdiction against the use of the circuit on June 13th, 14th, and 15th, under any conditions whatever by any automobiles. On these days the course is to be treated with special dust-laying preparations. We trust we shall learn later that permission has been granted to the British and other foreign competitors, who have been selected to drive on behalf of their respective countries, to test their Cup Race cars on the circuit, under reasonable conditions, prior to the race.



GORDON-BENNETT RACE.—French Eliminating Trials. Plan showing the positions of the grand stand, weighbridge, &c., at the starting point on the Auvergne Circuit.

Midland A.C. Hill-Climb.—A very interesting and successful hill-climb was held by the Midland A.C., on Saturday last, in the private grounds of Middle Hill House, near Broadway, Worcestershire. Hitherto, the Midland Club have held their annual hill-climb on Sun-rising Hill, and although there has never been the smallest mishap, or real inconvenience caused to any of the public, in deference to the opinions expressed by a few faddists, the committee have no doubt wisely preferred to change the venue to private grounds, especially when such an excellent opportunity was afforded in being able to utilise Middle Hill, by the courtesy of Mrs. Flower and Baron Max de Tuyl. As a test of climbing powers and skill in driving cars no better selection could have been made, as not only are the gradients severe, but the turning and twisting of the road is a considerable handicap in regard to speed. Some idea of this may be gathered when it is stated that not more than about 200 yards of the course can be seen at any point. This



Middle Hill-Climb.—The Course.

whole arrangements were perfectly carried out, telephones being installed and the route thoroughly "flagged," so that no possible hitch could occur.



ISLE OF MAN ELIMINATING TRIALS.—Mr. Hall Caine is a spectator at Quarter Bridge Control.

Photo by Mr. Frederic Coleman.



MIDDLE HILL CLIMB.—1. Mr. C. Sangster and Mr. Harvey du Cros, Jun., with the 30-h.p. Ariel on the weighbridge at Broadway. This car scored the time of 5m. 23½s. 2. Mr. Millership at the starting point on his 6-h.p. Wolseley. Mr. Millership's time was 8m. 41½s. 3. Mr. E. M. C. Instone starting No. 1, and appropriately scoring No. 1 time of 4m. 24½s., although Mr. Martin's 35-h.p. Daimler tied in regard to time. 4. An interesting scene at the weighbridge. Local horse dealers taking advantage of the occasion to train their animals to motor cars.

The preliminary weighing of the cars took place at Broadway, the start for the actual event being made at half-past two by Mr. E. M. C. Instone's 30-h.p. Daimler, which came out at the top in regard to speed, although Mr. Martin's 35-h.p. Daimler curiously scored exactly the same time, viz., 4m. 42½s. The next best time was made by Mr. C. Sangster's 30-35-h.p. Ariel of 5m. 23½s., another 30-h.p. Daimler, driven by Mr. H. C. Holder, being timed for the next best in 5m. 42½s. The smaller cars also showed up well, particularly the different Wolseley machines, while the little 8-h.p. Ford of Mr. Blakiston's managed to put up the time of 11m. 13½s., a very creditable performance considering the very severe test of the climb. Entries and driving were confined to members of the club. In all, 23 cars started, 20 successfully getting through. In addition to a large number of visitors on cars, a considerable sprinkling of the local public were keenly interested in the entire proceedings. The awards will be made on the following formula:—

$$\frac{\text{time in seconds} \times \text{h.p.}}{\text{total weight in lbs.}}$$

The results so far as time is concerned are as follows:—

Entrant.	Car.	min.	secs.
1. E. M. Instone ...	30-h.p. Daimler ...	4	24½
2. P. Martin ...	35-h.p. Daimler ...	4	42½
3. C. Sangster ...	30-h.p. Ariel ...	5	23½
4. H. C. Holder ...	30-h.p. Daimler ...	5	42½
5. H. F. L. Hemmings ...	12-h.p. Lanchester ...	8	1½
6. E. W. Lewis ...	8-h.p. Rover ...	8	4½
7. R. R. Brown ...	10-h.p. Wolseley ...	8	8½
8. H. L. Smith ...	16-h.p. Wolseley ...	8	20½
9. A. J. W. Millership ...	6-h.p. Wolseley ...	8	41½
10. A. Remington ...	6-h.p. Wolseley ...	9	5
11. J. Mayfield ...	12-h.p. Climax ...	9	13½
12. J. V. Pugh ...	12-h.p. Lanchester ...	9	14
13. A. W. Windsor ...	12-h.p. Wolseley ...	9	31
14. H. Austin ...	6-h.p. Wolseley ...	9	38
15. H. P. Barker ...	10-h.p. De Dion ...	9	40½
16. W. Allday ...	8-h.p. Allday ...	9	51½
17. H. J. Bourne ...	7-h.p. Bourne ...	9	53½
18. Rev. H. G. Morgan ...	12-h.p. Lanchester ...	11	3½
19. A. Blakiston ...	8-h.p. Ford ...	11	13½

Mr. G. H. Lanchester, on a 20-h.p. Lanchester, and Mr. E. Manville, on his 35-h.p. Daimler, both unfortunately had bad luck with their ignition and retired.

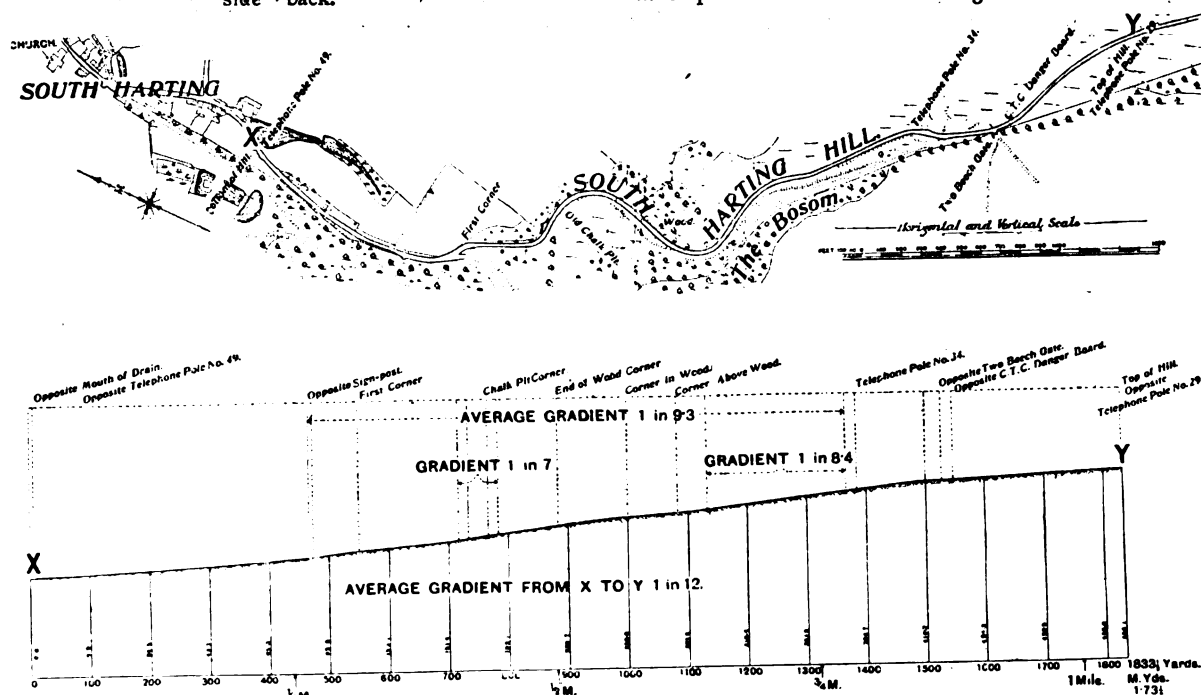


MIDDLE HILL CLIMB.—Changing gear on Mr. A. W. Windsor's 12-h.p. Wolseley at the first steep pitch. A contrast in the varying interest taken by the passengers is seen in the occupants of the front seat and the "off side" back.

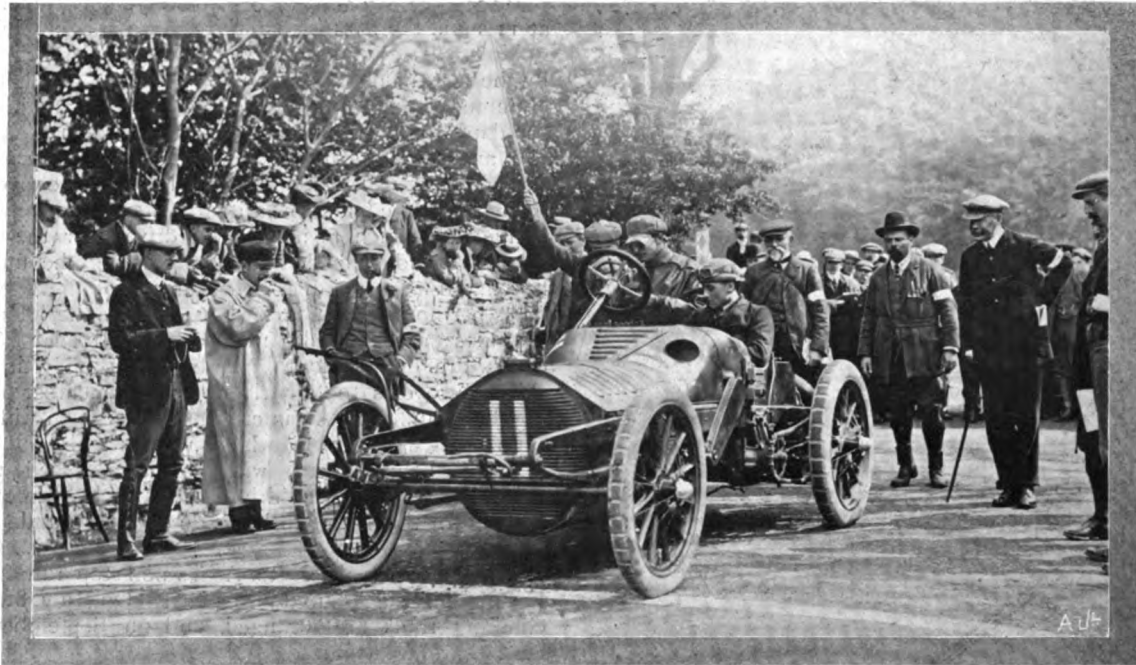
Race Meeting at Welbeck.—On June 17th, starting at 11 a.m., the Nottinghamshire Automobile Club are holding a series of racing events on the Welbeck track, by the permission of the Duke of Portland. The programme comprises a flying kilometre handicap for standard touring cars. For this the Wilson Challenge Cup and gold medal will constitute the first prize. A scratch event will follow for the fastest time over the flying kilometre and a third item is a speed-judging competition in which members will drive over the flying kilometre and, immediately after crossing the finishing line, hand in, in writing, their estimate of the speed in miles per hour at which they have covered the kilometre, the most accurate obtaining a gold medal. These events are open only to members of the Nottinghamshire club, cars to be driven by the member or his regular chauffeur. An interesting competition will be a supplementary item in which visitors only, all automobilists being barred, will join in a speed-judging competition for the cars driven over the flying kilometre. Entries for this item will be made on the ground.

On June 29th, the Notts A.C.'s non-stop run for the Foster Challenge Cup takes place. On July 8th hill-climbing trials are arranged, and on September 2nd motor car races on the sands at Skegness for touring cars are to take place under the auspices of the club.

South Harting Hill-Climb.—This hill-climb, organised under the Competition Rules of the A.C.G.B.I., takes place at South Harting to-day (Saturday), there being every promise of a very successful and full meeting. The particulars of the trial, which is open to tourist vehicles only, were published by us recently. It has since been announced that steam cars are eligible to take part in the climb. The above map, showing the gradients and the plan of the course, should prove useful to those of our readers who are attending this event. Weighing takes place at Petersfield at 10.30 a.m.



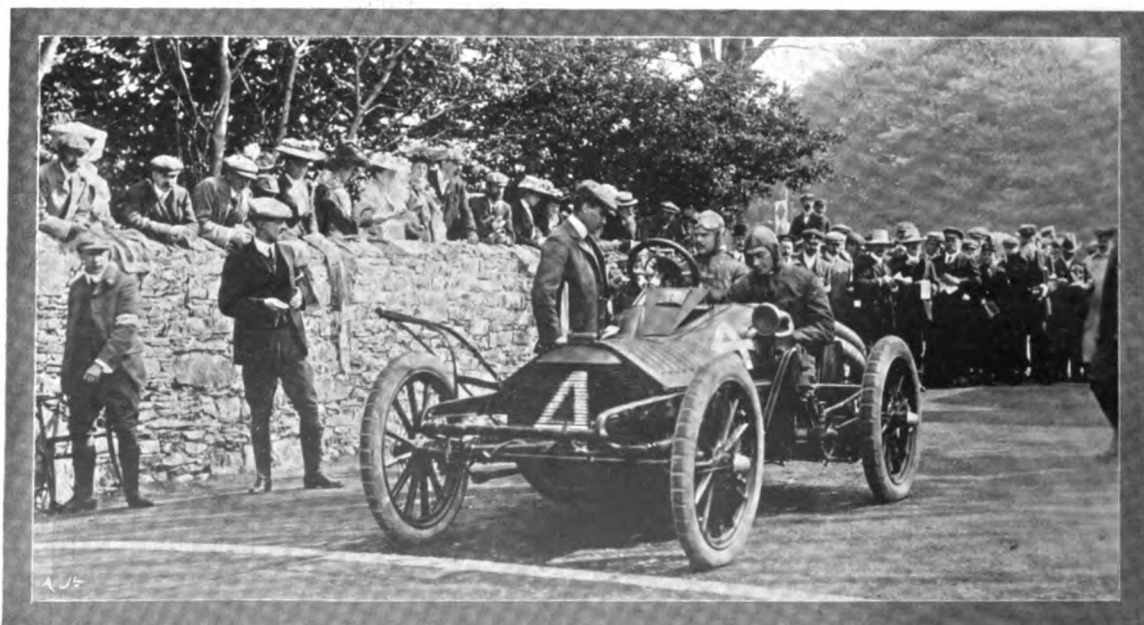
SOUTH HARTING HILL CLIMB.—Section and plan of the stretch of road over which the hill-climbing contest organised under the auspices of the A.C.G.B.I. takes place to-day, Saturday. The hill has an average gradient of 1 in 12, including a short stretch of 1 in 7. The winding character of the road renders this hill-climb a severe test for both engines and driver.



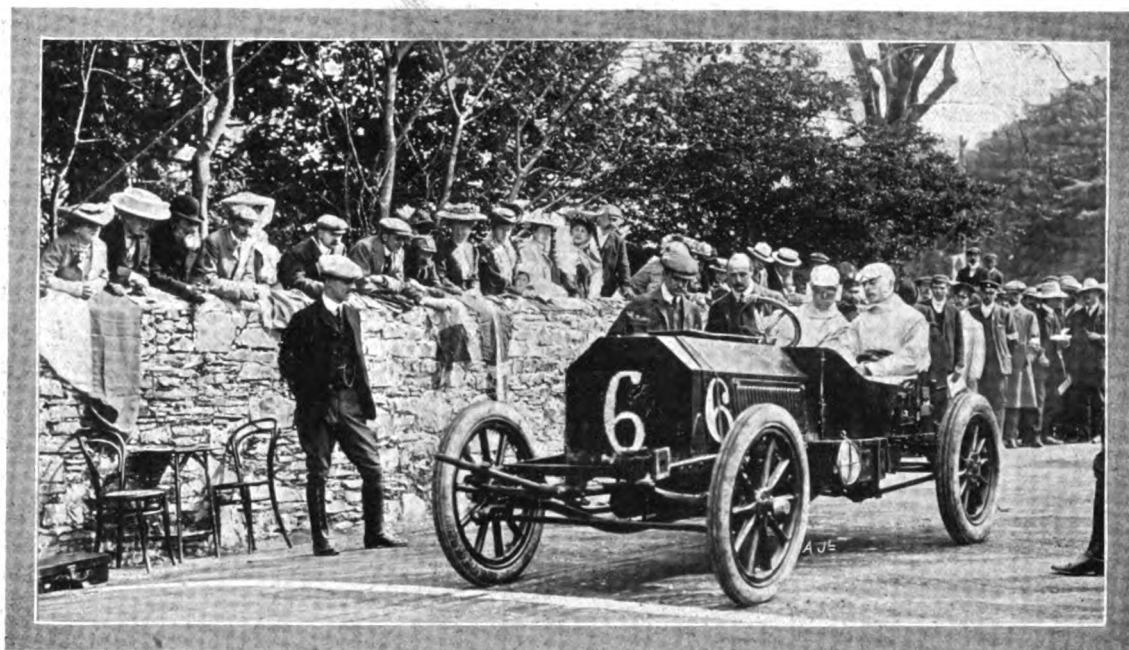
ISLE OF MAN ELIMINATING TRIALS.—The 90-h.p. Wolseley (No. 11), driven by the Hon. C. S. Rolls (Britain's second representative), being sent off.

Buckrow Brow Hill-Climb.—The North-East Lancashire Automobile Club held their first hill-climbing contest on Thursday, May 25th. The spot selected for the event was Buckrow Brow, some $2\frac{1}{2}$ miles on the Ingleton Road from Settle. None but members of the club were eligible as competitors. The competing cars were divided into five classes, regulated by the price of the cars. 20 cars were entered by the members, and of these 17 were actual starters. The course commenced at a point some 50 yards away from the famous ebbing

and flowing well, and after a slight down gradient of about 50 yards the rise began, and the finish was not only steep but had also a rather nasty turn, which afforded a test of the skill of the drivers. The distance covered was 1,010 yards. Mr. A. P. Gerland, of Accrington, electrical engineer, gratuitously provided electrical timing and telephonic apparatus, which worked most satisfactorily. Mr. Ainsworth, of Accrington, acted as timekeeper, and Mr. T. P. Ritzema, jun., of Blackburn, as starter, Dr. Musson, of Clitheroe, officiating as



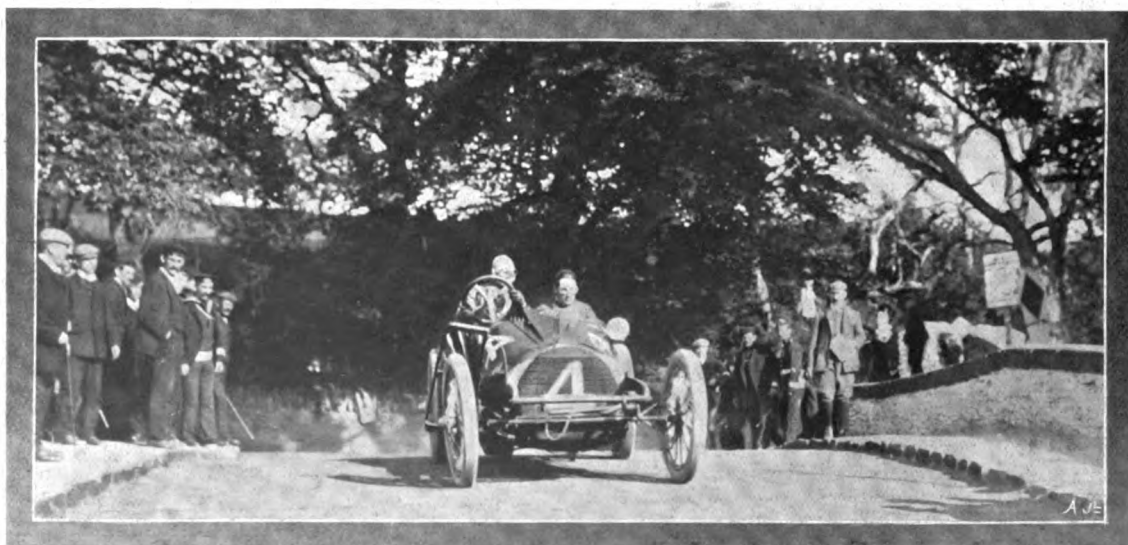
ISLE OF MAN ELIMINATING TRIALS.—The 90-h.p. Wolseley (No. 4), the third British car, driven by Bianchi, at the starting line.



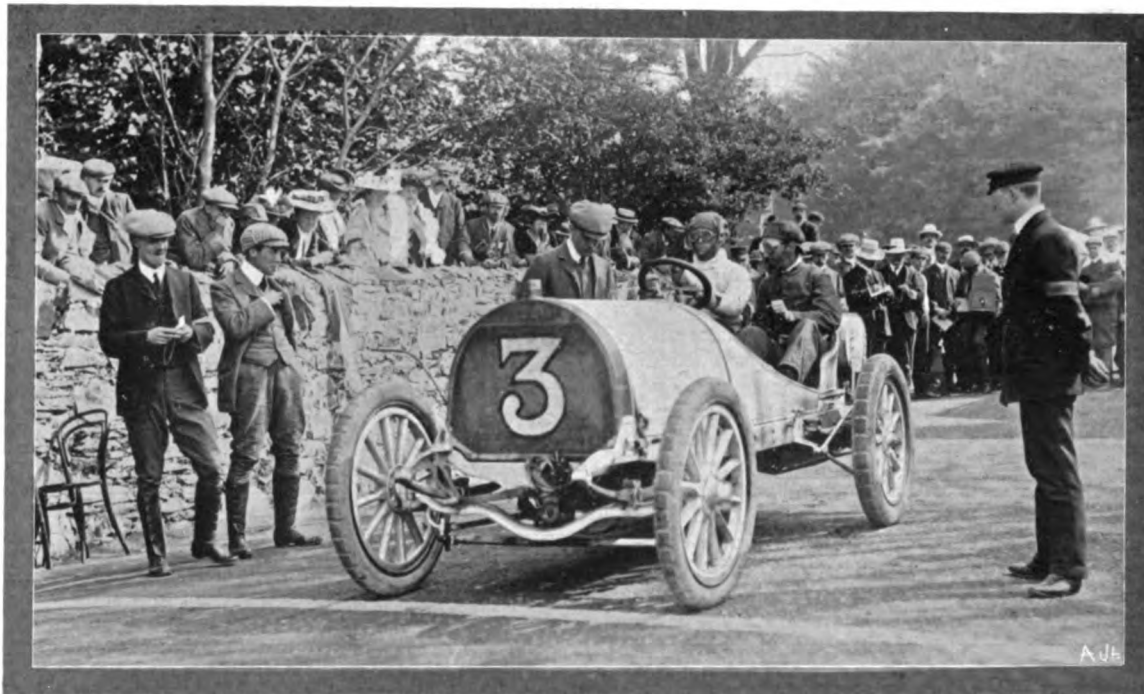
ISLE OF MAN ELIMINATING TRIALS.—Mr. Cecil Edge (the first reserve), and his 80-h.p. Napier (No. 6), waiting for his turn to be sent off.

judge. The course had the night previous to the contest been marked out, and final arrangements made by the club's most enthusiastic vice-president (Mr. William Birtwistle), assisted by Messrs. Cayley and Ritzema. The proceedings were favoured by fair weather, the roads were in good condition, and the competing members and their friends had most enjoyable runs on the various cars to Settle. After partaking of luncheon the competitors and spectators betook themselves to the scene of operations. Some very good times were done in the first class, confined to cars not exceeding a cost price of £200, the winner being Mr. R. Lord, on a 10-h.p. Vulcan, in 2m. 34½s.; the second in that class being Dr. Fox, on a 6-h.p. Belsize Jr., in 2m. 36s. In the second class,

Mr. Thomas Saul was the winner, on a 8-10-h.p. Brown; in the third class, Mr. A. Huntley-Walker, on a 15-h.p. Darracq—making the ascent in 1m. 48½s.; in the fourth class, Mr. William Smith, Jr., on a 28-38-h.p. Belsize; and in the fifth class, which was open to all cars over a cost price of £750, Mr. Huntley-Walker, on a 70-h.p. Darracq, was the first—doing the distance in 1m. 16½s.; and Mr. Fred Birtwistle was the second, on his 18-28-h.p. Mercedes, in 1m. 32½s. The whole of the proceedings were conducted without a single hitch or unpleasantness, and the whole affair reflects the greatest credit upon the organisers and others who were entrusted with the carrying out of the various arrangements.



ISLE OF MAN ELIMINATING TRIALS.—Bianchi and his Wolseley (No. 4) finishing at Quarter Bridge.



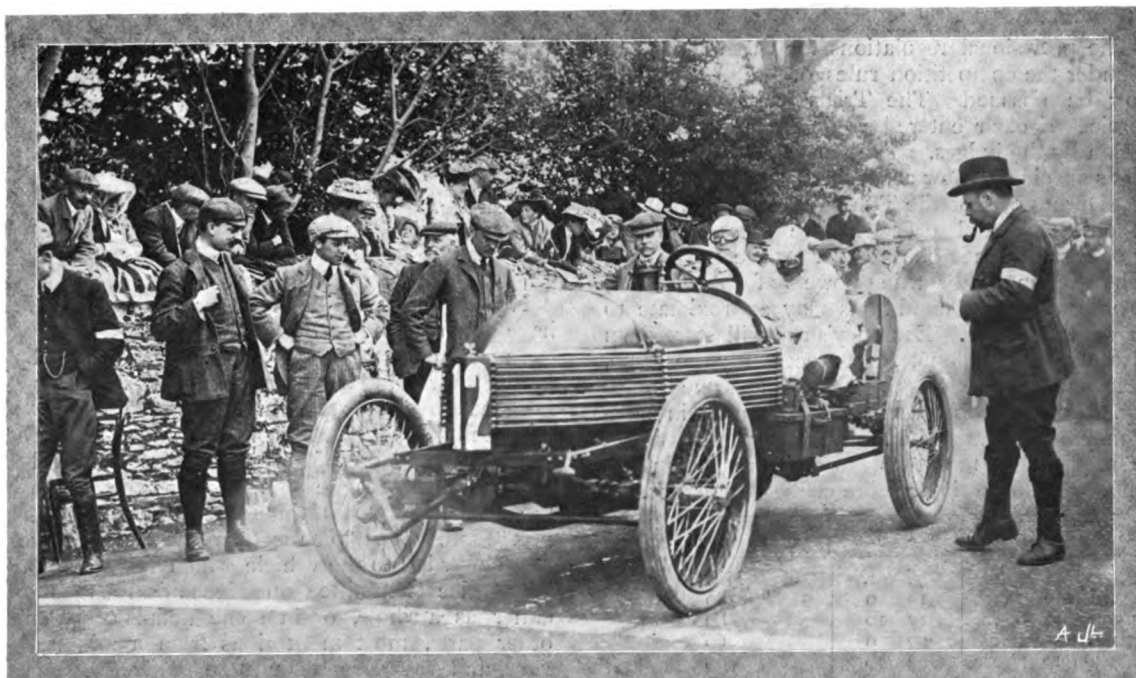
ISLE OF MAN ELIMINATING TRIALS.—Mr. A. L. Guinness, on his 90-h.p. Darracq (No. 3), at the starting line.

Southern Motor Club.—The first contest of the season of the S.M.C. took place on Saturday last, when the 100 Miles' Reliability Trials for the "Howlett" Challenge Cup for cars and tri-cars carrying one or more passengers, was decided. Each competitor had to drive his own machine, and the speed was limited to twenty miles per hour, the minimum time for the 100 miles not to be less than 6 hours, and the maximum time not to exceed 7 hours. The route was to Offingham Lodge

(two miles from Worthing), and the start was from the George Hotel at Morden, the course lying through Esher, Cobham, Guildford, Horsham, Washington, and Findon, and back through Crawley, Horley, Redhill, Mersham, and Croydon. The starters were:—Mr. T. W. Maynard (De Dion car), Mr. C. B. Ward (Pope Toledo car), Mr. C. Pattison (Humber car), Mr. W. L. Lorkin (Rexette), Mr. H. Billing (Excelsior tri-car), Mr. C. H. Pugh (Minerva tri-car), Mr. C. H.



ISLE OF MAN ELIMINATING TRIALS.—Along the side of Snafell. The Star car (No. 1), driven by Mr. H. G. Goodwin, at full speed.

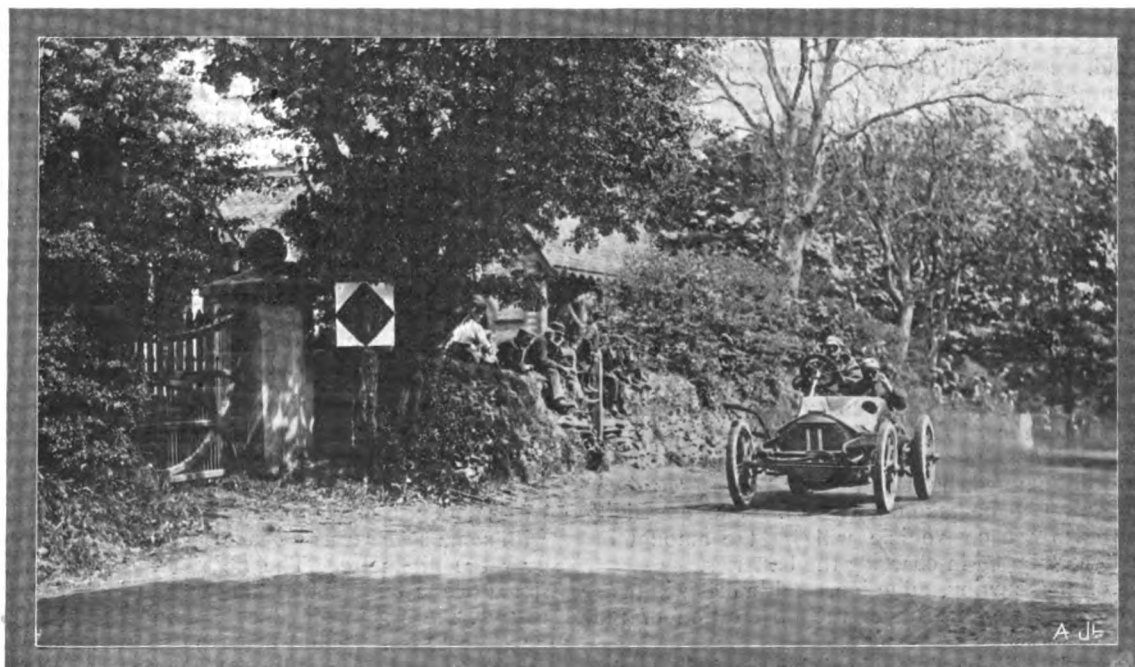


ISLE OF MAN ELIMINATING TRIALS.—Mr. A. E. Macdonald, on the World's record 90-h.p. Napier (No. 12), getting ready for his turn to start.

White (Humber tri-car). Mr. Ward led off, being soon overtaken by Mr. Lorkin, who was afterwards passed by Mr. Pugh near Horsham. The latter sustained a burst tyre and was overtaken by Mr. Lorkin, who was going splendidly, and who finished first in 6h. 23m., his machine having only one traffic stoppage at Guildford. The only other competitor to finish was Mr. Pattison, who reports having missed the road, and did not seriously continue the trial. The other competitors

reported various troubles, the most serious being Mr. Pugh, with a burst tyre.

THE Padley Wood Hill Competition, organised by the Sheffield A.C., will take place on July 1st, when both the car and the motor cycle sections will be divided into two classes, viz., privately-owned vehicles, and vehicles used in any way whatever for trade purposes by members who are in the trade.



ISLE OF MAN ELIMINATING TRIALS.—On the way to Ballasalla. The Hon. C. S. Rolls driving No. 11 Wolseley.

Light Delivery Van Trials, Sept. 20 to Oct. 24, 1905.—The provisional regulations for these Trials, to be held under the competition rules of the A.C.G.B.I., have now been issued. The Trials will comprise 30 days' service of each entered vehicle and subsequent examination by the judges. The length of the daily run will vary as specified below according to the class of the vehicle. During part of the Trials the vehicles may be run without load, and every vehicle must stop any number of times, as may be directed, for the purpose of testing the stopping and starting powers of the vehicles, and in order that the conditions may approximate to those of actual service. Each day's run will start from and finish at specified depôts, not necessarily the same, all vehicles in the same class covering the same routes each day. Loads will be provided by the club in such form as may be determined, and the driver and assistant may be required at the dépôt to assist in loading or unloading. The following are the classes, loads, &c. :—

Class and Loads.		Fee.*	Approx. Daily Mileage.
		£ s.	Miles.
A	... Up to 5 cwt.	15 0	80
B	Over 5 cwt. to 10 "	17 10	80
C	" 10 " to 1 ton	20 0	60
D	" 1 ton to 1½ tons	22 10	60

* For entries received after 12 o'clock noon on Wednesday, July 26th, 1905, up to August 23rd, these fees will be increased by 25 per cent.

Two vehicles only of the same type, by the same maker, may be entered in any one class. In entering, manufacturers will have priority over their authorised agents.

Vehicles will be, throughout the Trial, under the control and observation of the club, and in the event of any vehicle being withdrawn, or failing to complete the Trial, such vehicle must be dismantled by the competitor sufficiently to satisfy the official observer as to the cause of the failure, and the judge may also require to make examination if necessary. The body of each vehicle must be approved by the club, and must provide a comfortable seat for the observer, such accommodation and the weight of the observer himself counting as part of the load. Each vehicle must carry only one man in addition to the observer. One assistant per vehicle may be on duty at the dépôt, and no other person shall assist the driver in replenishing fuel, adjusting, repairing, &c., except by permission of the observer, when a record will be made.

The vehicles must not be touched on any conditions on Sundays, and all labour, fuel, and stores for each vehicle during the trial must be supplied by the competitor. Competing vehicles must be in the dépôt by 5 p.m. September 19th. Subject to a fine of £5 vehicles may be delivered up to 10 p.m. on that date. The runs will start at 8 a.m. September 21st, and the finishing run will be October 25th. Fuel consumption or electrical energy will be recorded throughout. The quantity of water used will also be recorded. The time for *changing* batteries will be noted, but the time for *re-charging* such batteries will not be taken notice of. The electrical energy used by each vehicle will be the amount of electrical energy used in charging the batteries.

Trials of manœuvring, adhesion, and brakes will take place from time to time under the observation of the judges.

The awards will be determined by the judges, who will take into consideration the performance of the vehicles in regard to—

- Absence of noise.
- Accessibility for examination.
- Appearance during Trial.
- Brakes.
- Condition after Trial.
- Consumption (on a price basis).
- Design and construction.
- Ease of manipulation.
- Finish.
- Manœuvring.
- Nuisance to public, e.g., smoke.
- Price.*
- Rapidity of opening up for re-
placement of parts subject to
renewal or repair.
- Repairs and replacements.
- Reliability.
- Restarting on hills.
- Speed.
- Steering.
- Ton mileage.

* NOTE.—If an electric vehicle uses two sets of batteries, the cost of both sets shall be included in the price of the vehicle.

No allowance will be made for any wear which may have taken place previous to the Trials.

In each class there will be a Gold Medal and a Silver Medal awarded in addition to money prizes, for which a fund has been started with a donation by the club of £50 and £25 from Messrs. W. H. Smith and Son. In addition the Society of Motor Manufacturers and Traders have contributed the sum of £400 towards the cost of the Trials, and part of this sum may be allocated to the prize fund. A diploma is offered by the Army Council to be awarded to the vehicle which is considered by the War Office Committee on Mechanical Transport to be either as a whole, or in some details of its engines or other parts, most meritorious from a military point of view, and therefore likely to be of service, even though indirectly, to the Army.

All time spent daily in replenishing, lubricating, adjusting, repairing, and getting up steam will be recorded on the certificates, subject to a maximum period of 30 minutes being allowed in the dépôt both before and at the conclusion of each day's run for these operations. Time in excess of 1 hour occupied in replenishing, lubricating, &c., will be added to the running time of the following day's run, and any vehicle not ready to start by noon any day may be prevented by the judges from further taking part in the competition or receiving any award, although it may continue in the trials under observation. Vehicles must be properly washed when required, such time not being noted on the certificate.

Except authorised stops, all involuntary stops will be noted, and each vehicle will be tested for starting from rest, when fully loaded, on an ascending gradient not exceeding 1 in 8. Failure to accomplish this will disqualify from receiving an award. Drivers may only be substituted during a day's run in the event of the original driver being incapacitated. No speed above the legal limit will be permitted, and all the usual regulations in regard to rules of the road, driving slowly through towns and villages, &c., will be strictly enforced.

The club reserves the right to abandon the Trials if the number of entries on August 23rd does not, in its opinion, justify them being held.

Ostend Automobile Week.—Prince Albert of Belgium has accepted the presidency for this important automobile gathering at Ostend, which takes place from July 9th to 16th under the auspices of the Flanders and Antwerp Automobile Clubs. We have already given particulars of this meeting, which will open on July 10th with some speed tests for racers and also for tourist cars over the kilometre. The next day the racers will be timed over 10 kilometres and the tourist cars over 5 kilometres, the 12th being devoted to a tourist run over 240 kilometres. Times over the standing mile will be taken on the 13th both for racing cars and tourist vehicles, the rest of the week being devoted to receptions, appearance competitions, corso fleuri, &c.



ISLE OF MAN ELIMINATING TRIALS.—Mr. J. Hargreaves, who is selected as second reserve, and his 80-h.p. Napier in Ramsey Control. Starting the motor.

MOTOR BOATING.

Boulogne-Folkestone-Boulogne.—We have from time to time recorded the various details when available in connection with this very important race for motor boats taking place on July 15th next. The full regulations are now to hand, and from these we make the following summary:—The race, run under the auspices of the A.C. de France, is international and open to every type of mechanically-driven motor boat. The course is from Boulogne to Folkestone and back in one stage, the distance being 51 marine miles (91.45 kiloms.). The start will be at 8.15 a.m. and the time limit for classing boats on the return to the starting point is 6 p.m.

The classes are as follows:—

Racers.

Series 1. 6½ to 8 metres. Series 2, 8 to 12 metres (40-foot English boats are included in this series). Series 3. 12 to 18 metres. Series 4. 18 to 25 metres.

Cruisers or Pleasure Boats.

These are divided into four series, according to the length, cylinder capacity, width of beam, and height of freeboard, as under:—

Class.	Length, Maximum.	Beam, Maximum.	Freeboard, Minimum.	Displace- ment.	Cylinder Capacity. Maximum.		Power, Maximum.
					Petrol.	Paraffin.	
1st	m. 6.5 to 8.0	m. 1.6	m. 0.47	kilos. 480	litres. 3.75	litres. 6.75	h.p. 27
2nd*	8.0 to 12.0	2.10	0.6	720	7.5	13.25	53
3rd	12.0 to 18.0	2.85	0.8	1,080	15.0	26.75	107
4th	18.0 to 25.0	No	limit.				

* English 40-ft. boats are included in this series.

Fishing Boats.

Fishing boats can be entered in a supplemental class, and may have motors of any power. The definition of a fishing boat is given as one actually and exclusively engaged in fishing as a business.

The entrance fees are 100 francs for boats up to 8 metres and 200 francs for longer craft, entries closing on June 24th at single fees, double fees being chargeable from that date until July 8th, when the lists finally close. Entries must be sent through the respective automobile clubs recognised by the A.C. de France in each country. Boats taking part must be at Boulogne by July 12th. Until July 15th, the boats may be run outside in the roads for the purpose of testing the engines, &c. On July 14th, an exhibition of the boats will take place in the floating dock. All the boats will be sent off at the same time upon the firing of the starting-signal—a cannon-shot. In case of any getting into distress, provision is being made for conveying the boats across. The turning-point at Folkestone will be marked by a properly-placed buoy.

Marine Motor Club Fixtures.—On July 25th races will take place at Plymouth, the Eliminating Trials for the British International Cup are down for August 1st, off Bembridge, whilst on the same day an open handicap for *bonà fide* cruisers and racers over 25 and 30 feet, restricted M.M.A. classes, will be held. On August 2nd and 3rd the Reliability Trials will be run off, whilst probably about August 8th a regatta will be held on the occasion of the visit of the French squadron. During the last week in August, in connection with Windermere Regatta, races will be run for the 40-foot open racing class, and also for the 25 and 30-foot restricted M.M.A. classes, together with a handicap for *bonà fide* cruisers. For all these events substantial money prizes are offered. The total membership of the Marine Motor Club is now 91.

THE Marine Motor Club have arranged with the A. C. de France for the admission of existing 40 ft. boats into the 12 metre racing classes during this year. The A. C. F. have further agreed to an allowance in future of 18 cm. beyond the 12 metres, so that a boat built before the end of this year, measuring 12 m. 18 cm., will be

admitted to the 12 metre class. As 40 feet in English measure is equal to 12 m. 19 cm., it will only be necessary to reduce the length of an existing boat by 1 cm., approximate $\frac{1}{8}$ of an inch, to admit them to that class.

ON June 13th, the British Motor Boat Club will conduct (in connection with the Oulton Broad Regatta) its first motor boat races on Oulton Broad, near Lowestoft, Suffolk. The races will be held under the rules of the M.M.A., and the first event to be run off will be the race for the Brooke Challenge Trophy. Only motor boats not exceeding 30 ft. in length are eligible.

A handicap race, for motor boats exceeding 18 ft. and not exceeding 40 feet over all, will also be run. Another handicap, for motor boats not exceeding 18 ft. over all, will also be held.

About the middle of June, there will be a series of races on one of the leading rivers. A day's racing will take place on the River Crouch, at Burnham, on June 24th, the programme including two events, both handicaps, the first being for cruisers and yachts' launches exceeding 20 ft. and not exceeding 30 ft., and the second for boats under 20 ft., which will be handicapped on previous performances.

Racing will take place in Belfast Lough in July, and on the occasion of the visit of the French Fleet to the Solent, in August, there will be an international race for a 50-guinea challenge cup and gold medal for boats over 25 ft. and not exceeding 40 ft. There will be also an international race for boats of 30 ft.

On August 8th, in Southampton Water, there will be an international race for a challenge cup and gold medal for boats exceeding 30 ft. but not exceeding 40 ft., there being no time allowance. There will also be a cup to be raced for on the same day by boats over 30 ft. and under 40 ft., the handicap for which will be made by the Racing Committee. At Cowes Regatta there will be a handicap for boats of 30 ft. and under, on a date to be arranged; while, during Ryde Week, a cup will be given for a handicap for yachts' launches not exceeding 30 ft. over all.

During Burnham Week, which opens on August 12th and closes on August 19th, there will be a number of races on the Crouch, and the closing meet of the club will be held in September.

"Baby II" takes a rest.—Various doubtful, incomprehensible, and more or less conflicting rumours having reached us of the sinking of "Baby II." in the harbour at Harwich during the regatta, we wire Mr. Mawdsley Brooke for any information on the subject with which he might care to furnish us, and any photographs of the melancholy occurrence which might be in his possession. We have received, in reply, the following breezy and entertaining letter, which we make no apology for reproducing for the benefit of our readers:—

"Unfortunately, we have no photos of the sinking of 'Baby II'; there was no one on board who had a camera; if there had been, we are afraid they would have been otherwise occupied. However, a passenger on the yacht 'Merrymaid,' Harwich, was taking photos of the sinking, and if you can get into communication with them, we think it is possible you may be able to obtain prints or the negatives.

Harwich regatta, as you may know, is an annual event of some considerable importance, being the first important event of the season, to which very nearly all the East Coast yacht clubs hold races from their particular ports to Harwich.

My own club, the Royal Norfolk and Suffolk Yacht Club, started their race at 6 o'clock on Saturday morning, and at 10 o'clock Mr. Humphery and other passengers left with me in 'Baby II' for Harwich to pick up the other boats.

We had to plug through awful seas, worse than ever we met with at any time at Monaco, particularly at Orford Ness, where the spindrift was so bad and the wind and sea so high that it was almost impossible for us to see to steer the boat.

However, we fetched Harwich Bar in good time, doing our best to get pooped in crossing with ebb tide and south-easterly breeze, and reached Harwich, snugly lashing up to the side of 'Lorna Doone' in the Pound at 2 o'clock, not having a dry stick of any kind on our boat, our portmanteaus being saturated with oil and water.

We made best use of our friend, Mr. G. A. Bruce, the owner of 'Lorna Doone,' and very soon this good ship was converted into a drying yard.

After having purchased sundry new clothes in Harwich, one suit complete having been fixed up for 35s. by one of our passengers, we proceeded to inspect the very large fleet of yachts arriving from Port Victoria, Burnham, and other ports.

We had a look at the 'Gloria' steam yacht 'Gipsy Lady,' and a pleasant chat with Mr. C. J. Morgan with his 'Palagia,' who was laying well up the river when we turned down stream to try and find Mr. Benn with his newly acquired 'Betty.' This we succeeded in doing, well to the end of the fairway, and after having a chat with Mr. Benn we turned down to the Pound for dinner.

We had not gone 200 yards down the fleet of yachts before there was a snap, and I knew at once that the port steering wire had parted, and the most effective way of checking the speed of the boat was to switch off the engine on the magneto and electric and let it act as a brake to the propeller. This I did, but the boat, as all left-handed propeller boats will do, swung at once to the starboard and made a bee line for the 'Merrymaid,' a fine racing yawl.

By putting the helm hard over I hoped we should just clear her bows and strike her bobstay, but such was not our luck, and we struck her about 6 inches from the stem at about 12 knots, taking some of her copper sheeting off, and at the same time telescoping the bows of 'Baby II' and splitting her planking from the keel piece.

Although we made every effort to save the boat by canvas strips round her underneath and slings, we received so little assistance from the crew of the 'Merrymaid,' we were unable to do so, and in seven minutes she sank in 30 feet of water, stem down. We had time, however, to get a sling on to the tail shaft and another round her bows, and tied one of our lifebuoys on to the end of this sling, so salvage operations should be fairly easy.

The boat is partly covered in Lloyd's, and salvage operations will probably be carried out by this society.

Our return home was eventful, our shipwrecked crew being transferred to the 'Lorna Doone,' which left Harwich with eight good persons on board, for the fifty odd miles for Lowestoft, and in the hopes of the wind southing. The man who drew the sweepstake for arrival at 5 o'clock was jubilant. I was, however, fortunate enough to draw the 11 p.m. sweepstake, which proved to be five hours earlier than the time destined to arrive in Lowestoft Harbour.

After eighteen hours hard punch through heavy seas, with a dead-nose wind and invalid passengers occupying berths below, to hang up in a heavy sea off Aldeburgh for three hours in the middle of the night waiting for favourable tide, was no joke, particularly after losing a good ship that one knows would have carried one through such a sea without anchor or hindrance."

At the annual Southsea Regatta, which takes place on July 26th, a special feature of the programme will be motor boat racing.

SIXTEEN motor boats have been ordered by the London County Council. These are to be attached to the various piers under the Council's control.

THE Thames Conservancy Board are providing 70 sand bins for use in the event of fires occurring on petrol launches when at or near locks on the Thames.

It has been decided by the A.C. de France that the Coupe Quinonès de Léon is to be competed for during the Aix-les-Bains Motor Week on the Bourget Lake. The Coupe Récopé is to be run for at Arcachon on the day following the contest for Sir Alfred Harmsworth's International British Cup.

Seine Motor Boat Races.—On Sunday last, under the auspices of the Hélixe Club of France, some important racing took place on the Seine at Suresnes, when for cruisers a new world's record was established by De Dietrich II. This fine boat was timed over 24 kilometres, in which she had to turn five times, in 43m. 43³/₅s., giving a mean speed of 32.94 kilometres per hour. The Championship of Paris Cup over 100 kilometres for racing boats was secured by the Panhard-engined La Rapiere, built by Tellier, this boat covering the distance in 2h. 49m. 14³/₅s., and in spite of not starting until 6 minutes after the signal was given to get away. Bayard-Clement, which took part in this race, abandoned the contest.

THE King of Spain, by way of encouraging motor boating, has offered a Cup for competition in Spain, probably at St. Sebastian, the entries being confined to motor boats built in Spain.

In consequence of the eliminating trials for the International Cup for motor boats taking place on August 2nd, the Gaston Menier Cup is now finally fixed to be raced for at Trouville on July 27th next.

CONGRATULATIONS are due to the plucky voyagers who, after suffering "countless ills," succeeded in crossing the Atlantic successfully in the motor boat Gregory, built by the Standard Motor Construction Company. The boat is of very moderate size for such a tour, being only 90 feet long, 11¹/₂ feet in the beam, and having a draught of 4 feet. The storms encountered have rendered the voyage a record one, and it is almost a record voyage also for the amount of time taken, reminding one more of the exploits of the old sailing vessels in the worst of weather. A start was made from New York on January 5th, and after breasting a tempest, Captain Loose, who was skipper of the boat, was beaten back into New York. He made a second start on February 8th, and after 48 hours' voyage was again caught in a storm. The masts were broken, and it was for some time feared that the Gregory would be swamped. The battered fuel tanks caused a leakage of petrol, which rendered it dangerous to strike a match; but still the gallant captain persevered till he arrived at the Bermudas. Thence he resumed his voyage, on March 1st, with a heavy sea running, when one of his cylinders broke, necessitating a return to the Islands. He finally started from the Bermudas on March 19th, reached the Azores on April 4th, and finally came into Algiers on May 17th.

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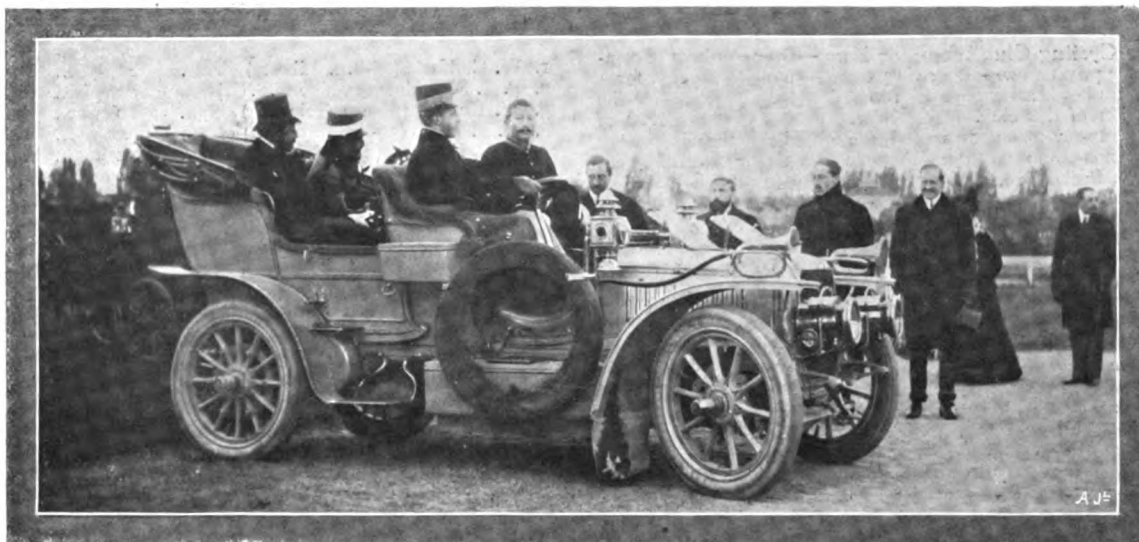


Photo by Underwood and Underwood.

His Majesty King Alfonso of Spain at the wheel of his 24-h.p. Panhard Car. His Majesty is an enthusiastic automobilist and has several cars, including another 10-h.p. Panhard, electric vehicles, &c.

A LARGE amount of interesting experience was crowded into the short period which King Alfonso of Spain was able to devote to the automobile side of Paris attractions. By way of a start, the King witnessed some of the crack motor boats show their paces on the Seine, the Hotchkiss, La Rapiere, and De Dietrich II. being singled out by the King for admiration. Following this, some of the cars participating in the Gordon-Bennett Eliminating Trials on the Auvergne Circuit next week were marshalled in the Bois de Boulogne and sent off at express speed past the King, those participating in this portion of the programme being Thery (on his Richard-Brasier), Sisz (on a Renault), and Beury (on a Darracq). Some perfectly charming designs were subsequently forthcoming in connection with the Corso Fleuri in the Bois, a very noticeable and delightful specimen of decoration being the De Dion-Bouton omnibus.

THERE is a probability that South Africa may ere long join the ranks of countries engaged in automobile manufacture. The demand for self-propelled vehicles is already great in the Colony, and even in central British Africa, is increasing by leaps and bounds, and the imports hardly seem to keep pace with it. Already a commencement has been made by certain firms who are arranging to do body work, and also presumably to carry out minor repairs. General manufacturing is likely to follow. Among the causes likely to contribute to this result is the neglect of European makers, in spite of all that has been written on the subject, to bear in mind African requirements. Cars *must* be built higher in the frame, to admit of adequate use on the roads encountered, particularly in view of the deep drifts and rivers that have to be crossed.

MOTOR CYCLING.

International Cup Race.—The French Eliminating Trials take place to-morrow (Sunday) on the Dourdan Circuit. The ballot for the order of starting took place last week, with the following result:—

- | | |
|---------------------------|---------------------------|
| 1. Alcyon (Tavenaux). | 9. Gillet (Fauvet). |
| 2. Magali (Bac). | 10. Griffon (Bucquet). |
| 3. Gillet (Lalanne). | 11. Peugeot (Giuppone). |
| 4. Griffon (Demester). | 12. Alcyon (Griet). |
| 5. Fleury (Demmler). | 13. Magali (Thomas). |
| 6. Peugeot (Champoiseau). | 14. Griffon (Lamberjack). |
| 7. Alcyon (Anzani). | 15. Peugeot (Cissac). |
| 8. Magali (Thomas). | |

It has been officially confirmed that the neutralised portions have been decided as follows, which it will be necessary to note to enable the times of the race to be followed:—

Dourdan, 15m.; La Foret de Roi, 3m.; Ablis, 5m. Total, 23m. per circuit=1h. 55m. for the five times round.

A novel method has been employed by Mons. D. Lamberjack to overcome the iniquitous proceedings of last year, when some evil-minded persons, it will be remembered, strewed the course with nails and tacks. He has commissioned a number of road-makers round the circuit to watch for these miscreants. The novelty consists in the method of payment to these watchers. Each one is to receive 5 francs before the Eliminating Trials. In the event of the course being kept clear of these obstructions, each man will receive after the trial another 5 francs. In the event of any of the road-makers detecting the criminal who may scatter these deadly little enemies of tyres, a reward of 100 francs is to be paid him. The same arrangements are to hold good, it is proposed, for the race itself.

Motor Cycling Club Non-Stop Run.—On Saturday the competition for private owners, driving their own motor cycles, for a non-stop trial over a distance of 100 miles, took place under the organisation of this club. Thirty-seven entries were received, of which twenty-seven actually started, the route being the same as the 200 miles non-stop run of the club which took place recently, viz., Stevenage, Puckeridge, Baldock, Royston, Broadwater, and Wadesmill. The weather was ideal when the start was made at about one o'clock, competitors being sent off at minute intervals. The rules provided for a non-stop run for the first 50 miles, fifteen minutes' interval then being allowed, but sufficient fuel had to be carried on each machine to run the full distance. At certain places on the road control marshals were established, who received from each competitor a metal check, thus keeping in touch in regard to time with every participant in the run. Thirteen competitors concluded the 50 miles, the others being either disqualified for not keeping to the schedule time, or for some minor reason connected with sparking plugs, tool bags, or dismounting on account of a road block, &c. By 7 p.m. the 100 miles test had been successfully completed by ten of the competitors, and from these it was necessary to select the three winners. The method

adopted for this purpose was by measuring a one mile stretch on the main road over which each competitor had to ride at the rate of 17 $\frac{1}{4}$ miles per hour. Each rider was informed of the exact time in which he was to accomplish the distance, but the use of either watch or cyclometer was forbidden, the object being to test the judgment of each competitor as to speed. The start for this final test was made at about 8 o'clock from a standing start, those remaining in being Messrs. Hart (London), Mays (Vincio), Gibsen (Vincio), Ashworth (Lagonda), Watts (Werner), Bottomley (Barnes tricycle), Badenoch (Humber), Fox (Fox), Porter (Brown), Davies (Werner). At the finish Ashworth was announced as the winner, his time being one-fifth of a second within the specified limit, whilst Bottomley and Hart were second and third with two-fifths of a second outside the allowed time.

THE Motor Cycle Union of Ireland held the second of the series of speed trials on Saturday last at Portmarnock in fine but breezy weather. Owing to the south-westerly wind, the committee decided to run the events from the Sutton end of the beach, finishing at the Malahide end, as on the occasion of the Motor Speed Trials last September. A new departure in the form of a mile handicap was introduced by the committee, and highly appreciated by both spectators and competitors; the finishes in both heats and final being very close. The arrangements in the hands of Mr. G. Mayne, hon. sec., were well carried out. Messrs. T. W. Murphy and Colman O'Connell timed, while Messrs. J. B. Dunlop and W. R. McTaggart officiated as judges. Details:—

One Mile Handicap.

Name.	Handicap.	Net Time.
	s.	m. s.
1. W. Gailfoyle (2 $\frac{1}{2}$ -h.p. Liberty) ...	25	1 47 $\frac{1}{2}$
2. P. S. Sheardown (3-h.p. N.S.U.) ...	20	1 53
3. W. Keating (2 $\frac{1}{2}$ -h.p. Triumph) ...	20	1 44 $\frac{1}{2}$
4. H. S. Hueb (3 $\frac{1}{2}$ -h.p. Minerva) ...	5	1 34
5. C. B. Franklin (2 $\frac{1}{2}$ -h.p. F.N.) ...	scratch	1 31

One Mile Scratch, unlimited as to weight for machines up to, but not over, 3 $\frac{1}{2}$ -h.p.

	m. s.
1. C. B. Franklin (2 $\frac{1}{2}$ -h.p. F.N.) ...	1 31
2. H. S. Hueb (3 $\frac{1}{2}$ -h.p. Minerva) ...	1 33
3. A. Summers (3-h.p. Triumph) ...	1 44 $\frac{1}{2}$

Won by 25 yards.

Two Mile Handicap. Machines up to and including 3 $\frac{1}{2}$ -h.p. Heats divided according to H.P. of machine.

	m. s.
1. C. B. Franklin (2 $\frac{1}{2}$ -h.p. F.N.) ...	3 11
2. A. Summers (3-h.p. Triumph) ...	3 35
3. W. Keating (2 $\frac{1}{2}$ -h.p. Triumph) ...	3 49

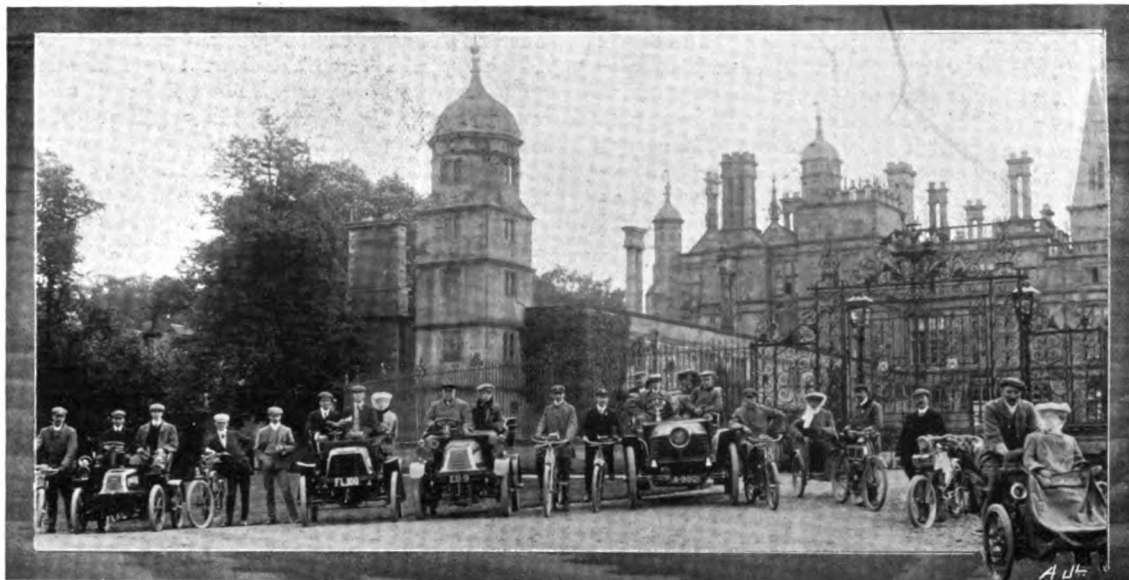
Won by 20 yards.



Encircling the World Week by Week.—In their triumphal progress round the globe, Mr. Glidden and his Napier car have, after covering, as we are informed, 24,053 miles in 201 days and in 22 different countries, at last run up against an obstacle, which it took them three days to surmount. This is nothing more or less than the extraordinary methods of the Dutch authorities in Java, who would appear to view the automobile with an even deeper suspicion than our most extreme anti-motorists in this country. More formalities had to be gone through, according to Mr. Glidden, to insinuate an automobile into Java than he had ever encountered in his life before. First of all, a permit had to be obtained from the Governor-General. Then a conference had to be held with the Resident. After this conference had taken place, instructions were issued that the car should be thoroughly inspected by the Chief Engineer of Railways, who finally gave his certificate as to the satis-

factory mechanical condition of the car, and deposed to Mr. Glidden being a careful and considerate driver. After this report, Mr. Glidden had to pay £30 to the Customs as a deposit—for what is not exactly clear—but presumably as a proof of his financial position and general good faith, and, after this, a permit was finally issued to him permitting him and the car to remain in the country for a period not exceeding six months. Considering the trouble involved in getting into Java, it is satisfactory to learn that the roads there are good, but this is to some extent discounted by the fact that the population is extraordinarily dense, amounting in all to some 35 millions, who pack the roads very closely—the justification, presumably, of the precautions taken by the Chief Engineer of Railways. Mr. Glidden's intention was to drive some 1,000 miles in Java, and thence proceed to Singapore and Johore, where he would cover some 500 miles; he hoped to reach London next week.

CLUBS AND ASSOCIATIONS.



The Marquis of Exeter, who is President of the Peterborough and Counties Automobile Club, recently invited the members over to inspect the art treasures in historic Burghley House. Our photograph shows a group of the visitors in front of the beautiful entrance gates of this charming mansion.

East Surrey A.C.—The arrangements for the season made by this club are commencing on Saturday, June 17th, with a run to Warnham; members will join in a combined outing every second Saturday of the month until October.

Marine Motor Club.—Mr. Lionel de Rothschild has been elected honorary treasurer of the club, and Messrs. Andrew Barr and Co. hon. auditors for the year. The Racing Committee of the club have already met and drawn up an extensive programme, which includes three regattas and assistance at a fourth, in addition to the already announced reliability trials.

In regard to the registration at Somerset House of the title of "The Marine Motor Club," a letter has been received by the new club from the British Motor Boat Club dissociating itself entirely from the action which resulted in the registration of such a title just before the public announcement of the selection by the new club of "The Marine Motor Club of Great Britain and Ireland." It is to be hoped, therefore, that under the circumstances whatever may have led to the registration at Somerset House it may now be allowed to gracefully cease from active existence, and in due course be numbered amongst those company creations which periodically appear in the official list issued by Somerset House under the heading of "Companies Struck Off the Register."

Motor Union Inter-Club Meet at Harrogate.—The arrangements for this meeting on June 24th comprise a reception by the Mayor of Harrogate in the afternoon, a concert in the Kursaal, and the Union dinner at the Hotel Majestic at 7.30.

The Yorkshire Automobile Club are displaying considerable energy in making arrangements locally, the hon. secretary, Mr. C. P. Wilson, of 5, Park Row, Leeds, having the details in hand.

Scottish A.C. (Western Section).—The programme for 1905 has been issued by the club, which gives particulars of weekly runs up to the middle of October. Amongst the more important fixtures is a hill-climb on September 23rd, and a 100 miles run and consumption trial on October 7th. The wind-up will be on October 14th with an anniversary run to Ayr Station Hotel.

A very praiseworthy move has been taken by the club mainly with regard to overcoming the dust-raising question, which at present is creating such an acute feeling with the public. It has been decided that for each of the organised club runs during the season the usual programme of travelling *en masse* will be abandoned, and for each run the places of meeting are merely suggested as rendezvous for members' Saturday's outings. The only exception to be made is for the anniversary run on October 14th, when for obvious reasons it is desirable the importance of the club's membership should be sufficiently apparent to be appreciated.

Sheffield A.C.—Non-stop runs during the season are again to take place in connection with this club. Any competitor who completes 100 miles "non-stop" will be given a certificate recording the performance, whilst a medal will be given to the member who completes a run exceeding 872 miles, the record distance accomplished by a member last year. In these runs members must be *bond fide* owners of each vehicle entered, which must be driven by the owner from start to finish. Non-stop runs for the motor cycle section will take place on one day to be arranged by the committee, entries for which must be with the secretary not later than August 31st.

Society of Motor Manufacturers and Traders, Limited.—The third annual general meeting of the members of the Society takes place on June 22nd at 3 p.m., at the Hotel Cecil.

H.R.H. the Prince of Wales has signified his continued patronage to the Society's Exhibition, at Olympia, in November. The first balloting for spaces at the Exhibition will probably take place within about a month.

The Society have made a grant of £400 towards the Light Van Trials of the Automobile Club taking place in September.



Electioneering Dialogues Up to Date :—

"Will you do your best in Parliament or out of Parliament to preserve the use of highways for all classes of persons, and to prevent the highways from being used to the danger, injury, intimidation, annoyance, or discomfort of the public?" was a question put to Captain Clive Bigham, Liberal candidate for Windsor, at a meeting in the Liberal Club.

"I occasionally, unfortunately, drive a small motor car, and I equally frequently ride a horse," said the candidate.

"When I ride a horse I hate every motor car I see—(laughter)—and when I drive a motor car I am nervous when I see a horse. (Renewed laughter.)"

"Therefore I can honestly assure the questioner that I will do my level best to keep the highways in their virgin state." (Laughter and applause.)

What the virgin state of a highway may be is a subject on which the gallant Captain's prospective constituents are probably still wondering, as also why the Captain says he "unfortunately" drives a motor, and "equally frequently" rides a horse. We hope the view of the Helston District Council that roads should be metalled but the metal not rolled in, does not form the Captain's idea of a "virgin state" as applied to highways.



From L'Automobile.

King Victor Emmanuel III. on his 24-h.p. Fiat Car. His Majesty is Honorary President of the Italian Automobile Club.

COMPARATIVE SAFETY OF HORSE AND MOTOR VEHICLES.

THE daily press has been so assiduous in propagating the notion that self-propelled traffic is much more dangerous to foot passengers and other road users than is the case with horse-drawn traffic, that few better services can be done to the cause of automobilism than demonstrating with sufficient convincingness how untrue this popular delusion is. Mr. S. F. Edge, who is always to the fore when an opportunity presents itself of benefiting the automobile cause, and who is exceedingly "fertile in expedients" for devising such occasions, arranged to carry out a number of tests at the Crystal Palace with a view of providing reliable data showing the comparative controllability of different types of automobile and horse-drawn vehicles.

The experiments were sudden stopping tests to show which of the following classes of vehicle could be most safely and quickly pulled up when proceeding at average speed, and they accordingly resolved themselves into the following four competitive contests:—

- A 2-ton lorry *v.* 2-ton horse-drawn railway van.
- A 30-h.p. landaulette *v.* horse-drawn carriage.
- A 15-h.p. touring car *v.* butcher's cart.
- A 90-h.p. racing car *v.* trotting sulky.

The arrangements for the experiments were that each competing pair of vehicles should be started abreast and run side by side together until the signal to pull up was made.

The events were managed by recognised official timekeepers with Kew certificated watches, and the absolute impartiality with which they were carried out was guaranteed by the presence not merely of leading automobilists but of the general press and representative owners of horses.

The experiments were extremely interesting, albeit carried out in wet weather. The cars apparently had

difficulty in going slow enough for the horsed vehicles, and in one instance Macdonald, who was driving the 6-cylinder Napier, was so intent on keeping neck and neck that he missed the signal to stop. The match between the Napier racer and the trotting sulky was undoubtedly the most sporting event of the afternoon, Mr. W. Bishop, on the latter, setting a pace of about twenty miles an hour, and pulling up in very fine style. The second match between the De Dion and the hansom cab was also exciting, and in the first match between this couple Mr. Stocks, on the car, stopped in the remarkably short distance of one and a half feet.

The following are the results of the tests:—

Distance travelled by vehicle before coming to rest.				Mean speed.
Motor Van <i>v.</i> Pair-horse Van.				
	ft.		ft.	m.p.h.
1st test	8		28	7.6
2nd test	9		24.2	7.8
Six-cylinder Napier <i>v.</i> One-horse Brougham.				
1st test	*26.5		53	12.0
2nd test	10		47.5	13.3
18-h.p. Mercedes <i>v.</i> One-horse Brougham.				
1st test	18		42.8	11.25
15-h.p. De Dion <i>v.</i> Hansom Cab.				
1st test	1.6		24.5	8.78
2nd test	7.9		33.5	11.25
15-h.p. De Dion <i>v.</i> Butcher's Cart.				
1st test	9.2		50.4	12.85
2nd test	14.2		38.4	13.85
Napier Racing Car <i>v.</i> Trotting Sulky.				
1st test	24.2		35	18.42
2nd test	26.6		43.5	20
* Driver missed seeing signal.				



The "Glasgow" Cup, which was offered in connection with the recent Scottish Reliability Trials, was won by the 12 h.p. Arrol-Johnston Car seen in our photograph. The Cup was offered for the lowest petrol consumption per ton mile during the entire trials, and the remarkable showing of 43.85 ton miles per gallon was made by this vehicle. Mr. J. S. Napier—the general manager of the Mo-Car Syndicate—drove, and he attributes the result chiefly to the efficiency of the special transmission gear employed by his firm. The power of the engine is controlled by a special throttle-valve, but no "automatic" carburettor is used.

We refer elsewhere to the (in our opinion) ill-judged attempts of the *Daily News* to make the motor car question a political party question. Our editorial refers to a leading article in the *Daily News*. The campaign has been followed up in that paper by the admission of correspondence on the subject, and an anonymous letter has appeared from a writer terming himself "a medical officer of health," who appears to think he has found a way of reducing the speed of motor cars in the neighbourhood in which he resides. He has a red flag a little over a foot square tied to the end of a stick. When he hears a motor car approaching he not only raises his hand, but this flag also, and this he finds invariably has the effect of stopping the car. If the car fails to stop, he states that he intends to take its number, telephone to the police, and prosecute. So far, however, no car has ever failed to slow down before him. Doubtless the automobilists he has encountered have concluded that they were meeting an escaped lunatic who had found himself temporarily in charge of a hippomobile, and not knowing what might happen, thought submission the wiser course. When he becomes generally known in the district, and when it is plain that he is not stopping the cars on account of the restlessness of his horse, but out of sheer obstruction, we trust to see this medical officer of health duly proceeded against as the public nuisance, which he appears to be, unless indeed in the meantime two ordinary medical practitioners have signed a certificate for his accommodation in the nearest asylum.

We believe that Mr. Rudyard Kipling and some others are of opinion that the motor car has a soul of its own. If this be the case, obsession by the Soul of a motor car would appear to be what is ailing with a boy who came into violent collision with one last September at King Street, Hammersmith. From the report of the evidence, it would appear to most people that no blame whatever attached to the motorist, as the boy was one of many who were jumping on and off the step of a tramcar, whilst the automobilist was travelling slowly (about 4 miles per hour) behind, sounding his horn unceasingly, when the boy suddenly jumped off right on to the motor car. In spite of this, damages of £100 were awarded against the unfortunate automobilist. Since the collision, it is declared by his mother that the boy's moral character has undergone a serious deterioration, and that without rhyme or reason he would cut up window curtains, bed clothes, and even attack his little sister. The most extraordinary feature, however, was that he was subject to occasional "rotary fits," when he would spin rapidly round like a dancing dervish. This is exactly what one would expect from the explanation offered above. On these occasions also the boy utters an extraordinary

grating sound which is said to present a striking resemblance to the attempts made by unskilled drivers to change gear, while blue lights and strange buzzings are also noticed by the boy, though it is not quite clear whether these appear to other people. The blue lights are suggestive of electric ignition. To take the matter seriously, we trust for the boy's sake that all these strange phenomena are only part of the exaggeration with which every mishap in which a motor car is concerned is invariably embellished by certain classes of the community.



Amongst the vehicles that succeeded in scoring complete non-stop runs in the recent Scottish Reliability Trials was the 4-cylinder 12-14-h.p. Gladiator car, of which we give an illustration above. It was entered and driven by Mr. Claud Hamilton, whose firm are the sole agents for these vehicles in the North of Scotland. Two other Gladiator cars—a twin-cylinder 12-h.p. and a 4-cylinder 16-20-h.p.—also took part in this important event, and made very good performances.



The first of the Crossley cars has already reached Australia, the photograph above reproduced being taken in Melbourne. Mr. James Cooke, of Messrs. Cowan and Sons, is at the wheel of the car, whilst Mr. Cooke's two sons are the other occupants.

ABOUT 24 officers of the Motor Volunteer Corps, with their cars, were, by command of the King, present at the review at Aldershot on Thursday, in honour of the King of Spain.

ONE is glad to see from a letter over his signature in the *Times* that the Earl of Wemyss is opposed to any fixed speed limit for motor vehicles, but desires in future that reliance may be entirely placed upon the point of driving to the public danger.

THERE is a parrot in New York who is determined evidently to do what in him lies to prevent anyone being run over by a motor vehicle. When anyone crosses the street near where he lives, he gives an absolutely perfect reproduction of the hoot of a motor car horn.

AN extraordinary collision occurred last week between a 'bus horse and a motor car in Chancery Lane. The 'bus horse tried to save himself by jumping clean into the automobile. As his hind legs came through the tonneau, it was some considerable time before he could be extricated.

VERY important work is being undertaken by the Motor Van and Wagon Users' Association in checking the closing of bridges to heavy motor car traffic by various county councils. They are enquiring into the rights in each particular case coming to their notice, and in every way endeavouring to protect the interests of manufacturers and users alike of heavy motor vehicles. Cases which they are now particularly dealing with are in connection with notices issued by the Staffordshire County Council and the Yorkshire County Council.

APROPOS of the Marquis of Queensberry and his "proposals," *Punch* observes that

when his arrangements for motorist-shooting in Hammersmith and neighbourhood are complete, it shall be looked upon as unsportsmanlike to fire at any automobilist who happens to be *en panne*, and that such "game" should be regarded as "sitting."

CORONERS no doubt allow themselves considerable latitude in the remarks which they think themselves permitted to make on occasion. One of these functionaries recently had the assurance to declare that the speed limit of 20 miles would not have been adhered to but that the Prime Minister was among the chief offenders against the Act!

MR. SOARES, as assistant anti-automobilist-in-chief to the House of Commons, does not want to wait until the expiry of the present Act before introducing "further legislation." But Mr. Balfour is of another opinion, and, in reply to Mr. Soares, stated that he had no intention of introducing any measure till after the inquiry or Commission promised by the President of the Local Government Board has been concluded.

MOTOR omnibus services are springing up all over the country with the commencement of the present season. Amongst the latest to start is the one inaugurated by the London and South-Western Railway between Yeoford Junction and Chagford in South Devon. Motor omnibuses are also to connect Llangollen with Snowdon on the west and Oswestry on the east, this service being in the hands of the Llangollen Engineering Omnibus Company, whilst nearer home a service of motor omnibuses commenced running this week between Charing Cross and Surbiton—a run of about fourteen miles. A number of other services are being completed, to commence within the next two or three weeks.



Recently we announced that the Maharaja of Baroda had secured for his personal use one of the latest types of De Dietrich Cars. In the photograph we are now able to reproduce, the Maharaja is seen occupying the seat in a 40-h.p. De Dietrich Car, beside the driver, Professor Mehsani, one of the Maharaja's staff, being in the tonneau.

SOME time ago, the automobilists of Dorsetshire, to whom a paternal Government had accorded the general distinguishing registration mark of "B F," petitioned the Local Government Board to have these distinguishing letters altered, as they proved an occasion of ribaldry amongst their friends. The registration letters for Northamptonshire happen to be "D F," and inspired by the successful results of the Dorsetshire appeal, Northamptonshire is now making a similar demand. The Watch Committee of the county are accordingly asking the Local Government Board to appoint the letters "N H" instead of "D F."

WE are glad that the magistrates thought fit to inflict a fine (albeit a small one) on a labourer who, doubtless as the result of the accident at Markyate, attempted to obstruct the road between that spot and Luton on a recent occasion. The labourer (of the name of Frank Terle), on seeing a car approaching deliberately walked right into the middle of the road. When the driver swerved to avoid him, he continued his crab-like course. The result was that the brakes had to be jammed hard down, and the car brought immediately to a stop—a proceeding which, needless to point out, did not add anything to its subsequent value. Had the brakes failed to hold instantly, or the distance been a little shorter, this agricultural nincompoop would have been more or less seriously injured, and then we should have had the press, from one end of the country to the other, shrieking about another horrible motor car tragedy, "almost on the very spot of the previous outrage!" Really, a 15s. fine hardly seems adequate to the occasion.

✱ ✱ ✱ ✱ CORRESPONDENCE.

* * *The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.*

THE POLLARD COMPOUND PETROL MOTOR.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I have read with some interest the description of the Pollard method of prolonging the expansion of the products of combustion. The reference to my attempts at solving this problem are not quite correct. My engines, of which I had four working night and day for two years, were arranged with the low-pressure crank at 195 degs. in advance of the 2-h.p. cylinders, by which means a very considerable reduction of back pressure was taken from h.p. pistons, the engine working on the principle of the differential hot-air engine.

In the Pollard engine, the exhaust is cut off by the h.p. pistons while at considerable pressure, and consequently reduce the limited advantage of compounding. The non-return exhaust-valves will get overheated and leak inert gases into the cylinder during the completion of the induction-strokes, and result in an impaired efficiency of the explosive action of the mixture.

I am, Sir, Yours truly,
EDWARD BUTLER, M.I.M.E. &c.

THE BRITISH "SELECTED" FOR THE G.B.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I shall be very glad if the Races Committee of the Automobile Club could see fit, through the columns of your paper, to explain to the hundreds of surprised motorists who were in the Isle of Man watching the Eliminating Trials why second place in the team selected for the Gordon-Bennett Race was given to the Hon. C. S. Rolls, and Mr. Cecil Bianchi relegated to third place. I am sure there can be no question as to who made the best record. I was under the impression that the men would be placed according to the results shown by the trials, and not according to the position which they hold in the automobile industry.

I enclose my card, but my name is not for publication.

Yours faithfully,
June 5th. "A LOVER OF FAIR PLAY."

COMMERCIAL POINTS.



THE De Dion-Bouton Company have issued an attractive souvenir, giving an artistically illustrated *résumé* of the rise and progress of this pioneer firm of motor car manufacturers. The souvenir, which is not of the ordinary "give away" booklet type, deals with the remarkable strides made by the power-propelled vehicle in the short period since it came into prominence. A copy of this booklet can be obtained by our readers upon application to De Dion-Bouton, Limited, 10, Great Marlborough Street, London, W. We give an illustration of the cleverly designed cover of the souvenir.

MR. A. H. D. ALTREE, who for more than four years past has acted as business manager to the City and Suburban Electric Carriage Company, Limited, has just tendered his resignation, but has arranged to remain at his post for a short period, so that the company may not be caused any inconvenience. Mr. Altree, it will be remembered, was for three and a half years general manager of the Daimler Motor Company, Limited.

AMONGST notable people who have recently placed orders for Brotherhood cars are the Marquis of Zetland and the Earl of Mar and Kellie.

THE numerous motorists who will shortly be visiting France for the Gordon-Bennett Race will be glad to be reminded of the reliable guide-book which is available, issued by the Continental Tyre Company, of 104, Clerkenwell Road, E.C. This not only gives a description of all the roads in the country, but is a complete gazetteer replete with information as to garages, hotels, petrol depôts, repairers, and doctors. It contains over 1,200 pages, and can be obtained for 2s. A very useful feature is the section giving details of tariffs and the regulations for obtaining permits to drive in France.

THE directors of A. Darracq and Co., Limited, have declared an interim dividend, payable on the 20th inst., of 1s. 6d. per share on the ordinary shares for the past half-year, being at the rate of 15 per cent. per annum.

MR. HENRY NORMAN, M.P., informs us that he has severed his connection with the Adams Manufacturing Company, Limited, the company which proposes to place the Adams-Hewitt car upon the market.

TWO out of the three cars selected in the Isle of Man Eliminating Trials, to represent Great Britain, were fitted with Dunlop motor tyres—a splendid testimonial to the quality of these British-made tyres. One of the competitors, the Hon. C. S. Rolls, wired to the company: "My Dunlop tyres ran splendidly throughout. Trying race never touched them"; while Mr. Cecil Bianchi wired: "Glad to say I had no trouble with Dunlop tyres on my Wolsley racer, either in practice or in race yesterday."

ANOTHER order from the Wandsworth Vestry, for one of their standard convertible tip and watering steam motor wagons, has just been received by the Lancashire Steam Motor Company, of Leyland.

Unauthorised Agents.—Messrs. De Dion Bouton, Limited, write us as follows:—

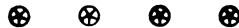
"A number of motor and cycle agents throughout the country advertise on their note paper and, in other ways, that they are certified repairers of De Dion Bouton, Limited, and as certificates have, for various reasons, been cancelled for the last three years, such an appointment is now entirely out of date, and might mislead customers. The only certificates now issued by De Dion Bouton, Limited, are those appointing selling agents for specified districts.

We shall be obliged if you can see your way to make this fact known to your readers, as a number of persons seem to expect us to be morally responsible for the work executed by agents holding out of date repairing certificates, which is a position we cannot see our way to accept."

THE British Empire Motor Trades Alliance has received an inquiry from a firm of railway contractors for the names and addresses of British manufacturers of steam cars for railway inspection purposes, metre gauge. Cars to be as near as possible to locomotive type. They do not want to purchase petrol cars if they can possibly get steam cars. The speed need not exceed twenty miles per hour, these cars are for shipment abroad. British manufacturers of the above, and of petrol cars, are requested to communicate with the Secretary, at 11, Red Lion Square, W.C.

THE New South Wales Government has placed an order with Messrs. Clarkson, Limited, for four of their Chelmsford steam omnibus chassis, whilst a repeat order has been received by the firm from the Victorian Railways for two further chassis for omnibuses.

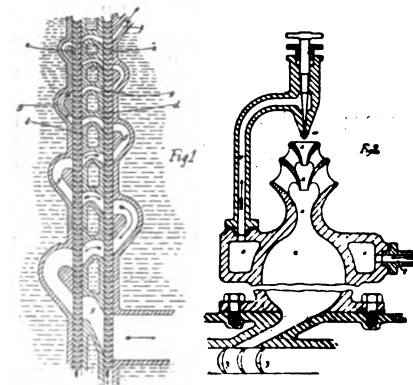
MANUFACTURERS who build motor delivery vans in addition to their tourist cars are well advised to issue separate catalogues for both vehicles. The Simms Manufacturing Company have sent us a neatly got up booklet containing particulars of their van chassis, and showing various styles of body. Some statistics are also included re the "economics of motor vans," so that altogether the catalogue should prove an acquisition to the business man who is alive to the advantages of motor cars for the delivery of light goods.



BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, Temple Bar, London.

The first date given is the date of application; the second, at the end, the date of the advertisement of the complete specification.

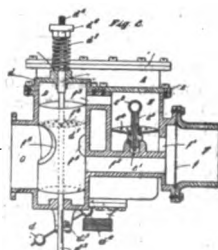
14781. 1st July, 1904. Improvements in Elastic Fluid Pressure Turbines. W. J. Crossley, of Crossley Brothers, Limited, Openshaw, Manchester, and J. Atkinson, of Benavie, Marple. The object of this invention is to utilise the combustion of oil or gas fuels in the turbine. There are six figures. Fig. 1 is a developed arrangement of the buckets and guide channels (diagrammatical) of the turbine guides and blades. Fig. 2 is a construction for the use of oil fuel. The turbine consists of a pair of revolving wheel, or discs fixed to one shaft carry-



ing the blades, *e, e*, with the fixed part, *d*, between the wheels. The blades, *e*, are at or near the periphery of and extending all round the discs. The nozzles, *f*, direct the working fluid upon the blades or buckets, *e*. It passes through the two rings of buckets, and is again deflected upon the buckets by the curved channels or guides, *g* (as indicated by the arrows), continued in the fixed sides and the intermediate piece, *d*. The radial blades, *e*, are crank-shaped in section, so that the working fluid can enter from either side. The working fluid passes from right to left, and then again from left to right,

as shown in the diagram. The sectional areas of the successive guiding passages, *g*, gradually increase, so that as the working fluid expands and its volume increases it travels at a more or less uniform speed to the turbine. This construction of turbine driven by hot gases is provided with two pumps, the one an air-compressing pump and the other for compressing gas. When the turbine is to be driven by oil fuel the apparatus shown in Fig. 2 is used. Oil is pumped to an extremely high pressure up to (the specification says) two or three tons per square inch in a separate reservoir, and passes by the pipe, *i*, into a space, *s*, placed round the combustion chamber, *u*, to vaporise the oil. The vapour then passes by the pipe, *v*, to the adjustable nozzle, *w*. The jet of vapour issuing at an extremely high pressure induces a considerable quantity of air to enter by the injecting nozzles, *x*, into the combustion chamber, *u*. The volume in the combustion chamber is increased by the combustion of the oil vapour. The quantity of air induced through the nozzles, *x*, may be greater than that required for combustion, so that the temperature of the air and gases may be sufficiently low to prevent injury to the turbine, some of the blades of which are shown at *z*. May 18th, 1905.

11842. 17th May, 1904. Improvements in or relating to Carburettors for Explosion or Combustion.



tion Engines. Frank Humphris, 192, Goldhawk Road, Shepherd's Bush, W. The object of this

THE Panhard and Levassor firm have determined to discontinue the manufacture of the 7-h.p. model which has hitherto given such a good account of itself. It is to be replaced by the new 8-11-h.p. 3-cylinder type, which has now been brought to a very high state of perfection, after prolonged testing. The Panhard Company have now entirely abandoned the making of 2-cylinder in favour of 3 and 4-cylinder types, the latest models being as hitherto in the hands of the sole concessionaires for Great Britain and Ireland, and the Colonies, Mr. Harvey Du Cros, 14, Regent Street, S.W.

MR. WINGFIELD, who has been associated with the Brotherhood-Crocker Company, Limited, as works manager, was last week the recipient of a presentation from his fellow-workers in the form of a marble clock, the occasion being his joining the Wolseley Tool and Motor Car Company, of Birmingham.



THIS is an illustration of the 1905 Edition of the Continental "Handbook for Automobilitists in Great Britain and Ireland," issued by the Continental Tyre and Rubber Company (Great Britain), Limited, of 104-108, Clerkenwell Road, E.C., which has now been issued, and which will be sent free of charge to all automobilists on receipt of 6d. to cover postage and packing. This book contains a vast amount of information required by motorists, and includes a list of all depots where their well-known Continental motor tyres can be obtained.

The Automotor Journal, June 17th, 1905.

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

Circulates amongst Makers and Users of Motor Cars, Cycles, etc., in the United Kingdom, the Colonies, and the Continent.

Offices: 44, St. Martin's Lane, London, W.C.

No. 232 (No. 24, Vol. X.)

JUNE 17TH, 1905.

[Registered at the G.P.O.
as a Newspaper.]

[Weekly, Price 3d.
Post Free, 3id.]



Photo by C. H. Park.

FILEY SANDS MOTOR RACES.—General view of the sands and the course for the races which were held on Whit Monday.

THE AUTOMOTOR JOURNAL.

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NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C., by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

1905.		
June 17	...	Car Trials and Races, &c., at Welbeck (Notts A.C.).
June 17	...	Froome's Hill-Climb (Herefordshire A.C.).
June 17	...	Fuel Consumption Trial (Southern M.C.).
June 24	...	Catford Hill-Climb (Southern M.C.).
June 24	...	100 Miles Passenger Trial (Motor Cycling Club).
June 24	...	Motor Union Inter-Club Meet, Harrogate.
June 29	...	Foster Cup for Non-Stop Run (Notts A.C.).
July 1	...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 1	...	Padley Wood Hill Climb (Sheffield A.C.).
July 8...	...	Auto Cycle Club Consumption Trial.
July 8	...	Notts A.C. Hill Climb.
July 12	...	*Hill-Climb (Henry Edmunds Trophy).
July 19-22	...	*Brighton Speed Races.
July 27-28-29	...	*Blackpool Motor Meeting.
July ...	...	24 Hours Run (Motor Cycling Club).
Aug. 2-3	...	*Motor Boat Trials (Southampton).
Aug. 11 or 13	...	*Quarterly 100 Miles Trials.
Aug. 14-19	...	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 26	...	Inter-Team Trial (Motor Cycling Club).
Sept. 2	...	Skegness Races on Sands (Notts A.C.).
Sept. 9	...	Brown Cup (Motor Cycling Club).
Sept. 12	...	Auto Cycle Club Race Meeting.
Sept. 14	...	*Tourist Trophy (Isle of Man).
Sept. 15	...	*Daily Graphic Cup (Isle of Man).
Sept. 20, Oct. 24	...	*Van Trials.
Sept. 23	...	Scottish A.C. Hill Climb.
Oct. 4	...	*Speed Trials.
Oct. 7	...	Scottish A.C. 100 Miles Run.
Oct. 14	...	Scottish A.C. Anniversary Run (Ayr).
Nov. 10 or 17	...	*Quarterly 100 Miles Trials.
Nov. 17-25	...	Society of Motor Manufacturers and Traders Exhibition at Olympia.

* Automobile Club of Great Britain and Ireland Events and Papers.

Foreign Events (Trials, Races, &c.).

1905.		
June 25	...	International Motor Cycle Cup.
June 20-28	...	Aix-les-Bains Week.
July 1	...	Boulogne-Cape Gris-Nez (Motor Boats).
July 5	...	Gordon-Bennett Race.
July 9-16	...	Ostende Automobile Meeting.
July 11	...	Start for Glidden Trophy (New York).
July 15	...	Boulogne-Folkestone (Motor Boats).
July 16	...	Mont Cenis Hill Climb.
July 20-26	...	Paris to the Sea (<i>Journal de L'Automobile</i>).
July 28-Aug. 8	...	Paris Industrial Vehicles Trials (A.C. France).
July 27	...	Gaston Menier Cup (Motor Boats).
July 31	...	Anthony Drexel Cup (Motor Boats).
Aug. 6-7	...	Circuit des Ardennes.
Aug. 10-16	...	Herkomer and Bleichroder Races.
Aug. 12	...	International Cup for Motor Boats.
Sept. ...	...	Brescia Automobile Meeting.
Sept. ...	...	Tri-Car Competition (<i>L'Auto</i>).
Sept. ...	...	Vincenzo-Florio Cup.
Sept. 1	...	Lake Geneva Motor Boat Meeting.
Sept. ...	...	Tourist Car Trial (A. C. de France).
Sept. 3-10	...	Royan Meeting.
Sept. 3-10	...	Spa Automobile Club.
Sept. 11	...	British International Cup (Motor Boats Arcachon).
Sept. 12-14	...	Lake Lucerne Motor Boat Meeting.
Oct.	Vanderbilt Cup.
Oct. 1	...	Chateau Thierry Hill Climb.
Oct. 15	...	Gaillon Hill Climb.

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PASSING EVENTS.

A Coroner to the Rescue.

CONSIDERING the amount of hostility that has been recently worked up with great skill in the columns of the anti-automobilist Press, which reached, perhaps, its most violent expression in the debate in the House of Commons, to which we referred last week, it is refreshing to be able to draw attention to the sensible and timely observations of Mr. G. F. Roumieu, the coroner for West Surrey. No one is in a position to speak with better authority on the relative danger to the public of different forms of locomotion than a coroner, particularly a coroner who, like Mr. Roumieu, deals with a very extensive district, and who is, in addition, able to cite the experiences of a deputy. The two officials between them take in three-quarters of the county of Surrey, and that is a district in which the roads are as much thronged with traffic, particularly automobile traffic, as in any part of England. Speaking at an inquest held last Saturday on the body of a child who had been run over and killed by a horse and cart, Mr. Roumieu very sensibly observed that had this accident been occasioned by a motor vehicle there would have been a heart-rending account of it in nearly every paper in the country. He is himself as hotly opposed to the reckless driving of motor cars as anyone, but he wished the jury to understand that, as far as accidents were concerned, he had only been as yet called upon to hold an inquest on one person killed by a motor car, while his deputy had similarly held but one such inquest. On the other hand there was hardly a month, scarcely indeed a fortnight, that they did not have to hold inquests on someone who had been run over by a horse and van. There exists a society of coroners, where these officials from various parts of the country meet from time to time and discuss their experiences. Consequently special weight must be attributed to Mr. Roumieu's further observation that his experience and that of his deputy were by no means unique, but, on the contrary, borne out by the experience of nearly every coroner in the country. He hoped that these facts might have some effect in assuaging anti-automobilist prejudice in the country. We feel sure that they will do so. Mr. Roumieu is an official, as we have had more than one occasion to point out, of particularly enlightened views. We have not the slightest doubt as to the correctness of his statements, and we can only regret that other coroners have not been willing to come forward with testimonials in favour of the new locomotion, though, perhaps, we shall see that altered now. We hope it may be so, for the enemies of the movement will not be long able to resist such a testimonial to the relative harmlessness of the automobile as is provided by the coroners of the country being all in its favour.

"Oh! That Mine Enemy Had Written a Book."

THE Marquis of Queensberry did very nicely in his interview with the West London magistrate, Mr. Lane. He got a good advertisement, and good advice from the magistrate. His name was in every paper practically in the United Kingdom, and, in fact, his public appearance gave rise to the belief that a new humourist had arisen from the obscurity of semi-private life. Had the Marquis been content to rest upon his laurels, all would have been well. But the celebrity he has earned has induced him to appear as an author in the columns of Pearson's penny weekly, and in this he throws off the mask, or

perhaps, considering the associations his name evokes, it would be better to say he "takes the gloves off." Out of the mouths of our adversaries, however, sometimes comes counsel, so that it is pleasant to find the Marquis stating that "The decent motorist has his rights" (though he does not say what they are), "and I am the last man in the world to dispute them." Further, Lord Queensberry does not believe in a speed limit, for a safe speed, he thinks, is entirely a matter of circumstances. But, perhaps, the most important statement in Lord Queensberry's contribution to *Pearson's* is his confession, that when he applied to the magistrate for permission to carry firearms to shoot motorists, he did not really mean what he said, and merely wished to draw public attention to the evils of reckless motor driving. In proof of this, he informs everyone that he has not yet applied for a gun licence. So Mr. Ford can drive his car in peace for the present, though, perhaps, considering his public utterances, if the Marquis does apply for a gun or pistol licence he may not find it quite so easy to obtain one.

The Registered Number Again.

ANOTHER example of the manner in which what was intended to be the indulgence afforded to manufacturers by the 1903 Act—the power to make use of a general identification mark by a yearly payment of £3—is being interpreted by the police to embarrass the motor car industry as much as possible, was provided in the West London Police Court last week, and one Sydney Walters was summoned for driving an unregistered motor car, and Mr. Harry Brackenridge, the London Road Car Company's motor manager, was summoned for aiding and abetting him in so doing. The car, of course, was provided with a manufacturer's registered number, but as the vehicle only consisted of a chassis and was not a finished car ready for sale, the prosecution insisted on the same interpretation being put on this clause of the Act as in the case to which we referred last week. The chassis was, in fact, being used for teaching a number of men who aspired to drive motor 'buses. No manufacturer, of course, will employ a fully finished car for this purpose, any more than jobmasters will employ a complete vehicle for teaching men to drive horses, or for breaking horses in, and it certainly never was the intention of the Legislature that manufacturers should be compelled to take out a full licence for chassis or half-finished cars used for such purposes. It is our boast in this country that the police exist for the benefit of the community. This method of interpreting a statute, literally, to the disadvantage of an industry, hardly agrees with this view. Mr. Lane, deciding on the case, said that the absence of provision for such a situation was certainly a *casus omissus*, and that the regulations ought to be altered by the Local Government Board to meet cases of this kind. He held that the offence was merely a technical one, and Sydney Walters was accordingly only fined 10s. and 2s. costs—the case against Mr. Brackenridge being dismissed. It is the obvious duty, in cases where the police are letting zeal outrun discretion, and using the literal phraseology of the statute for purposes which can only be described as persecution, for magistrates to adopt this line. After all, it is they and they only, who are any real check on what the police do, and we trust that in other cases of this kind where the magistrate cannot of course legally dismiss them, he will inflict even more merely nominal penalties. No doubt the automobile Members of the House of Commons will see that the matter is put right when the next Motor Car Bill is discussed.

The Lord Chief Anti-automobilist.

THE question of the speed of motor cars in the parks has at length been settled by the Divisional Court in a sense adverse to the automobile interest. The decision is a pretty serious one. It will not, of course, paralyse the automobile industry or even inflict upon it a serious blow. Motorists can keep out of the parks altogether without suffering any desperate amount of inconvenience, and they will probably soon have to do so; for it will now be quite legal for the Commissioners of Works (that is to say, in practice, the police) to reduce their speed to one mile an hour or probably even exclude them altogether. But the decision is serious from several points of view. It is serious as constituting a distinct encroachment on the rights of the public, and it is serious as demonstrating that we have a Divisional Court and a Lord Chief Justice always ready to stretch a legal technicality not in favour of, but *against* the new locomotion.

In future, it will be within the power of the Commissioner of Works (*i.e.*, the police) to make what rules they like as to what may or may not be done in the parks, and to put up the rules in the morning and prosecute anyone for infringing them in the afternoon. This was indeed practically what happened in the case of Mr. Musgrave. And there would seem to be no limit to what may be interdicted. If a crusty Commissioner objects to sneezing there is nothing to prevent him issuing rules prohibiting that salutary exercise, posting them up at 9 o'clock in the morning and taking the preliminary steps for a prosecution against some recalcitrant sneezer before he goes to his lunch. There is a story of a German police official who, being worried nearly every week by his superiors to put up notices forbidding something or other in the public places under his control, determined to save himself further trouble, and got out a short and simple notice, "*Alles ist bei Strafe verboten*" (Everything is forbidden under penalty). The Commissioners of Works (and the police) will now be legally entitled to adopt the same short and simple method with the public. In fact, it is not too much to say that henceforth the parks are places where the principles of the British Constitution do not apply.

How utterly opposed to English traditions the decision is, will be apparent to our readers the moment they recall the history of the case, the previous legislation on the subject, and the contentions that have been put forward for the defence. Under the Parks Act of 1872 the Commissioners of Works have the power of making statutory rules. Such rules must *either* be published in the *Gazette* a fortnight before they are put in force, *or* laid upon the table in both Houses of Parliament, the object, of course, being that the representatives of the people may learn what is being done and object to undue restrictions. The Commissioners in the early part of the present year actually drew up such statutory rules, and duly laid them before Parliament. In these rules there was no suggestion of a speed limit. But under these rules the police issued further subsidiary rules containing the 10 mile limit, posted them up and proceeded to enforce them. These police rules were *never* gazetted and *never* laid before Parliament—this much was proved by the evidence brought forward by Mr. Firth at the hearing before the magistrate—and was not denied before the Lord Chief Justice—and yet the Lord Chief Justice finds these police rules legal! The decision simply amounts to bestowing autocratic powers on the police inside the London parks!

The Result of Pure Prejudice.

That the decision is the result of prejudice pure and simple there can hardly be a doubt. Had the case involved the liberty of public meeting or even the regulation of ordinary horse-drawn traffic, the Lord Chief Justice would probably have been the first to fulminate against such official encroachment on the rights of the public. But the motorist seems to be *hors la loi* in the eyes of the head of the judicial bench. In fact his Lordship has plainly said as much on more than one occasion. In the case of *Rex v. Wells*, he declared that he found himself legally compelled to quash the conviction, but "very much regretted having to do so." In Lord Craven's case, too, when likewise quashing the conviction, he employed almost exactly the same language. Now this sort of thing, it is really not too much to say, practically amounts to a judicial scandal. Why should the head of all the King's Bench judges express regret at being compelled to carry out the law? The speed-limit in the parks is a comparatively small matter, it may be, but it is not a small matter for every automobilist to know that the head of the legal profession is so bitterly hostile and prejudiced that only under compulsion will he do justice to a motor car case. Country magistrates, as we have often had occasion lately to thankfully recognise, are gradually abandoning the prejudices against the automobile movement which so many of them have harboured in the past. This happy tendency is not likely to be promoted by the Lord Chief Justice's statements of his feeling on the question. Should his lordship indulge in any further observations of the kind it is to be hoped that we may see the attention of the House of Commons officially drawn to them by some of the automobilist members of that body.

The Advantage of a Quid Pro Quo.

SINCE first the proposal was put forward by the Roads Improvement Association, we have consistently and persistently supported the principle that where tramways are constructed on existing thoroughfares, the promoters of the tramway should be compelled to widen the road of which they practically appropriate so large a portion. We are pleased, therefore, to find that the Committee of the House of Commons, which is considering the London County Council's Tramways Bill, have accorded this principle their weighty recognition. Recently, as will be remembered, a Bill empowering the County Council to run their tramways over Westminster and Blackfriars Bridges, and along the Embankment, was passed in the House of Commons by the record majority of one. Since then the measure has been referred to a special Committee. The Committee has now decided that they cannot sanction the running of the trams over Blackfriars Bridge, at any rate, unless the County Council agrees to widen that structure. The decision of the Committee, it is, perhaps, hardly necessary to observe, is wrapped up in a good deal of complicated phraseology. But this is what it amounts to. Attempts were made by the County Council lawyers to induce the Committee to throw the burden of widening the bridge on the City Corporation. This, one is thankful to say, the Committee refused to do, and the position is at present that the matter is practically put back for the County Council and the Corporation to come to some understanding. We trust the Corporation will be firm in the matter, as a very important precedent for future action is concerned.



SOUTH HARTING HILL CLIMB.—General view from telephone pole, No. 34. The starting point is seen in the centre of the picture just to the right of the piece of water visible between the tree and the telephone pole. From this point after each car had passed, the road was signalled as clear, the signallers being seen on the bank notifying the starters.

SOUTH HARTING HILL CLIMB.

LAST Saturday was the occasion of a large gathering of motorists at South Harting, near Petersfield, they having assembled either to compete in, or to watch, the

hill-climb which had been organised by the A.C.G.B.I. in conjunction with the Sussex County A.C.

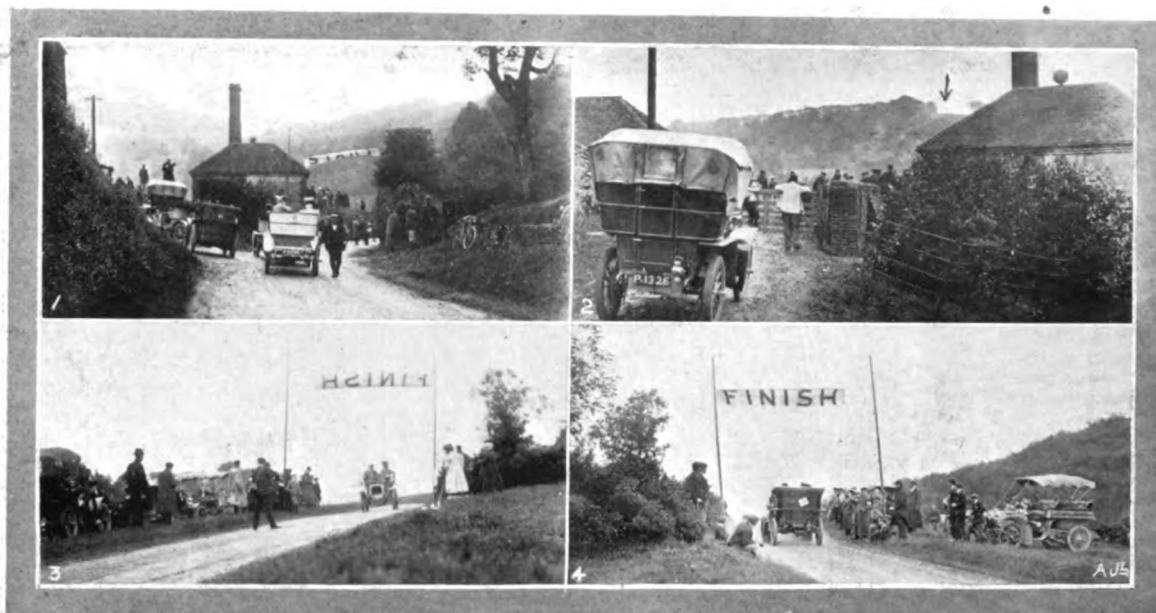
Although the meeting was only open to members of



General scene at the weighing-in at Petersfield. A Daimler on the weigh-bridge.

Mr. Gorham's passengers "re-assembling" on his 30-h.p. Daimler after weighing operations.

SOUTH HARTING HILL CLIMB.



The starting point. General view from behind.
The finishing point, seen from beyond.

Looking towards the finish. Coming up to the finishing point. Mr. Frederic Coleman's White Steamer driven by C. E. Stent, crossing the line.

The left fork road at the start, from which point the cars could be seen finishing. (See arrow.)

SOUTH HARTING HILL CLIMB.

the A.C.G.B.I. and to affiliated clubs, the committee received altogether forty-nine entries. The hill, of which we published a contour last week, is situated about half a mile from the village of South Harting, which is nearly four miles south-east of Petersfield on the road to Cocking.

Thirty-seven of the entrants turned up, and these very well represented the best-known touring cars both of British and foreign manufacture. The timed distance was 1 mile $73\frac{1}{4}$ yards, the average gradient over this length being 1 in 12, and including a short stretch of 1 in 7. Although this road has, in good weather, an excellent surface, the effect of the rain, which has been marring motorists' enjoyment in the South for some days past, was to make the hill particularly treacherous on account of the chalk slime which was produced. Several of

the competitors, in consequence, found the corners difficult to negotiate, and, indeed, every car had a strong bias towards seeking the ditch directly it left the crown of the road. Many factors contributed towards reducing the interest which the spectators and others took in the event. In the first place the new regulations of the club prohibit the officials from making known the times taken by the competing cars. Then again, the classification was on a price basis, and the unconvincing simplicity of this arrangement was complicated by "personal" handicapping, which thankless task was entrusted to Mr. Worby Beaumont, who is deserving of sympathy for his invidious position. This extraordinary arrangement of introducing a qualifying factor based on personal observation in order to level up mechanical results, appears to us to be not only undesirable, but even more



Mr. E. M. C. Instone waiting with his Daimler at Petersfield. Mr. Instone's car was second in Class C.

Mr. Walter Munn on his 10-h.p. De Dion in place for his start.

SOUTH HARTING HILL CLIMB.



Mr. Charles J. P. Cave's 24-h.p. Wolseley being given the word to "Go" by Secretary Orde, the starter.

Mr. G. V. Baxendale's 24-h.p. Thornycroft has a few moments' grace before the climb.

SOUTH HARTING HILL CLIMB.

open to question than the numerous formulæ which have figured so conspicuously in confusing the issues of other similar events.

Obviously, therefore, no comparative idea as to the

there any incident of note throughout the day; one car (Mr. Churchill's Hallamshire) after having succeeded in negotiating part of the hill backwards, essayed to regain a more dignified mode of procedure and failed in the



Miss Dorothy Levitt, whilst waiting at the start, takes the opportunity to refresh her 8-h.p. De Dion.

Miss Dorothy Levitt bringing up Mr. E. Cremieu Javal's Mors.

SOUTH HARTING HILL CLIMB.

various performances could well be obtained by the spectators, who consequently, for the most part, took but indifferent interest in the proceedings. Neither was

attempt. On another occasion a non-competitor, who had been advised of the proceedings, most discourteously passed Miss Levitt (the only lady driver) on the wrong



Mr. Dew's 10-h.p. Speedwell waiting the drop of the flag at the start.

View from above telephone pole, No. 34. Mr. W. H. Arnold's 12-h.p. Whitlock Aster coming up the hill.

SOUTH HARTING HILL CLIMB.



The stiff piece of climb just after the first turning.

Capt. Sir R. K. Arbuthnot's 12-h.p. Sunbeam taking the second bend.

SOUTH HARTING HILL CLIMB.

side of the road and at a critical point of the climb. The following are the results of the Trial as published to date, but these are based merely on actual times and the "personal" handicap allowances, and do not include the winner of the A.C.G.B.I. Gold Medal, open to all competitors, which will be determined under the club hill-climbing formula.

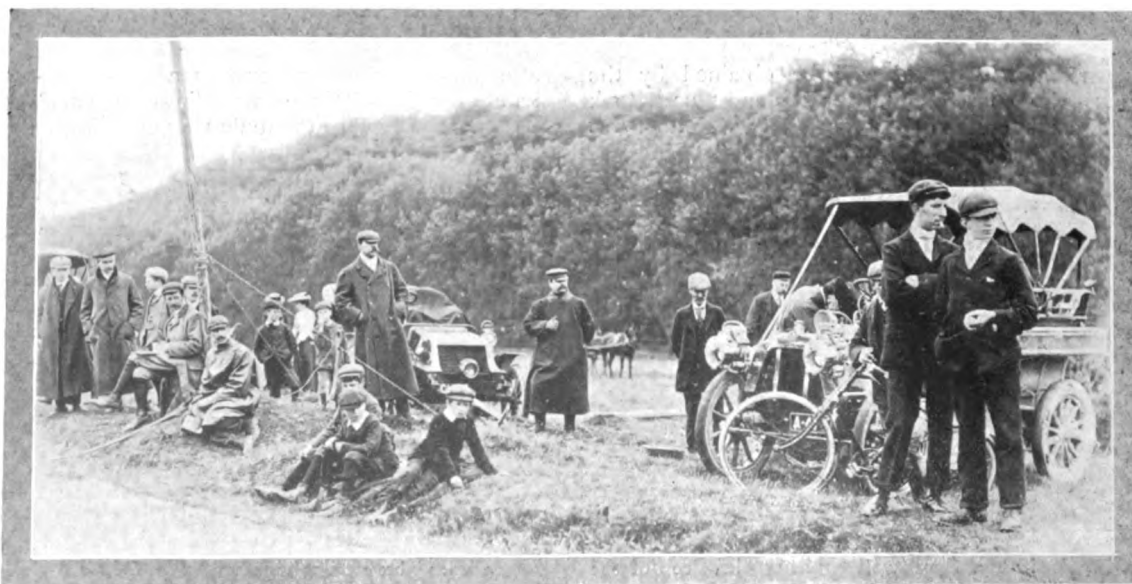
CLASS A. (cars £150 to £350).—1st (Earl Russell Cup), F. Adams' 8-10-h.p. Coventry Humber, driven by L. Coatalen; 2nd (A.C.G.B.I. Silver Medal), J. H. Dew's 10-h.p. Speedwell, driven by J. H. Dew.

CLASS B. (Chassis £300 to £500).—1st (Earl Russell Cup), T. C. Pullinger's 16-20-h.p. Beeston-Humber, driven by I. C. Pullinger; 2nd (A.C.G.B.I. Silver Medal), Mrs. Benet-Stanford's 13-h.p. Dixi, driven by Captain Benet-Stanford.

CLASS C. (Chassis £500 to £800).—1st (Sussex County A.C. Cup), E. Manville's 30-h.p. Daimler, driven by E. Manville; 2nd (A.C.G.B.I. Silver Medal), E. M. C. Instone's 30-h.p. Daimler, driven by E. M. C. Instone.

All cars carried four passengers, with the exception of those selling at or below £250, which were entitled to carry two passengers only. The success of the British-built cars in all classes is gratifying, particularly as the English vehicles entered were very much in the minority.

The arrangements were carried out very successfully by the officials, and the success of the meeting was in no small measure due to the valuable prizes presented by Earl Russell, who resides at South Harting, and who in many ways aided in the organisation of the event.



SOUTH HARTING HILL CLIMB.—Officials and others at the finishing point. The telephone installation is in the car on the right.

THE 1905 SIMMS-WELBECK CARS.—PART II.

THE 20-24-h.p. engine, seen from either side in Figs. 3 and 4, has its cylinders, of which the bore and stroke are 95 and 110 mm. respectively, cast in pairs complete with their water jackets and heads. All the valves, which are interchangeable, lie side by side, and their camshaft is further employed for operating the low-tension igniters, B^1 , which are ingeniously arranged on the same side of the engine. For this purpose, the tappet rods, B^2 , are bent, and the springs, B^3 —which produce a quick break—are arranged as shown in Fig. 3. The low-tension magneto, B , is mounted on a bracket on the opposite side of the engine, and is gear-driven by the exposed fibre and brass spur-wheels which lie in front. The moment at which ignition takes place is "timed" by the driver, who operates a hand-lever fitted below the steering-wheel. The timing devices, B^1 , consist of pivoted levers interposed between the cams and their push-rods, the pivots being mounted in tubular guides (seen in Fig. 3), where the levers pass through the crank-chamber. Sliding the levers inward or outward, alters the moments at which the cams release the push-rods, and consequently the time at which the igniter-contacts are broken.

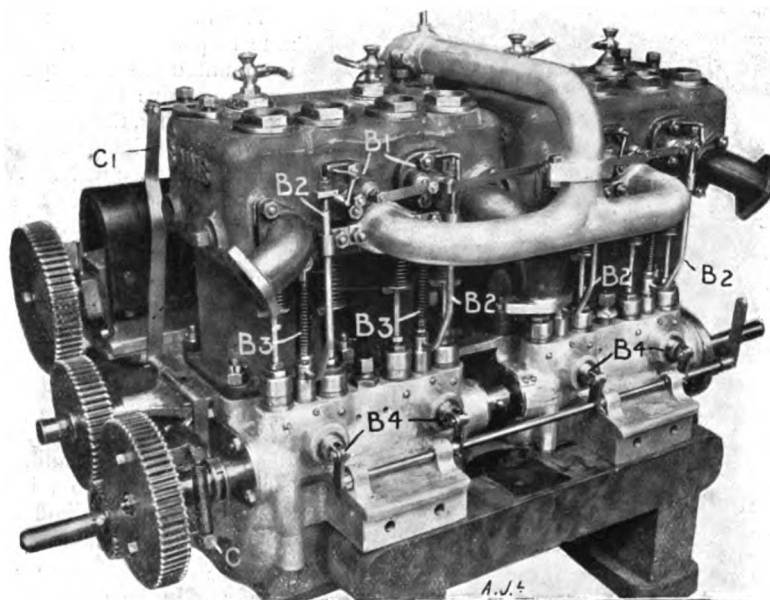


Fig. 3.—View, from the side, of the 20-24-h.p. Simms Engine, showing the igniters, B^1 , with their operating rods, B^2 , and timing gear, B^1 .

Half-compression cocks are fitted in the cylinder-heads, and inspection-plugs are provided over each of the valves, the plugs over the inlet-valves receiving the high-tension ignition-plugs. The carburettor is mounted on the same side of the engine as the magneto, and the induction-pipe, A^8 , passes across the top of the cylinders

to the inlet-valve chambers on the opposite side. The carburettor is prominent in Fig. 4, and a sectional elevation through the mixing-chamber is given in Fig. 5. The petrol passes from the float-feed chamber, A , to a jet, A^1 , which has three divergent orifices. Surrounding the jet, is a loose sleeve, A^2 , which has an enlarged conical flange at its upper end. Holes, A^3 , are drilled in the walls of this sleeve just above the jet, and when the engine is starting, most of the main air, which enters at A^4 , passes through these holes, and impinges on the spray cone, A^7 , on its way to the induction-pipe, A^8 . As the engine-speed increases, however, the suction in the mixing-chamber raises the sleeve, A^2 , against the action of the spring, A^5 , and so increases the area of the passage, A^5 , through which additional air can now reach the induction-pipe without passing over the jet. The passage, A^5 , is never quite closed, even when the engine is

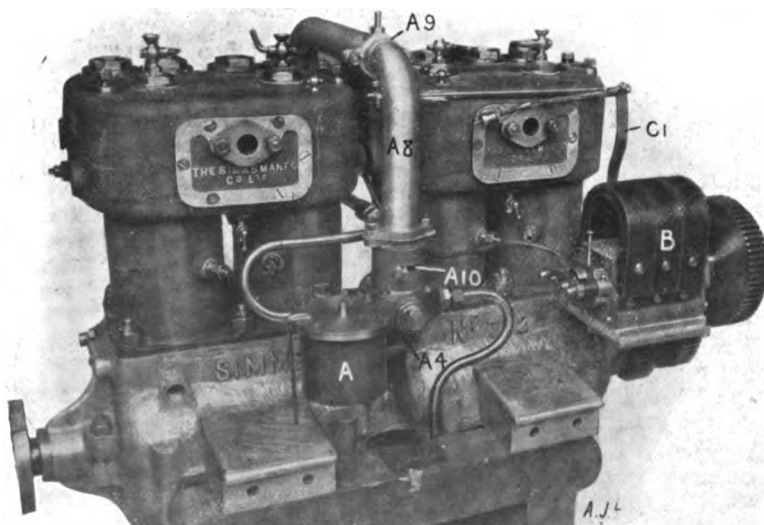


Fig. 4.—View, from the side, of the 20-24-h.p. Simms Engine, showing the carburettor, A , and the low-tension magneto, B .

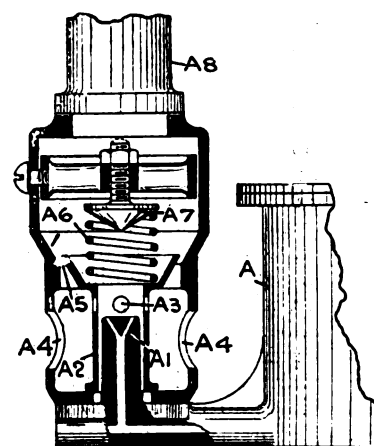


Fig. 5.—Sectional elevation through the mixing chamber of the carburettor, showing the sliding sleeve, A^2 , over the jet, A^1 .

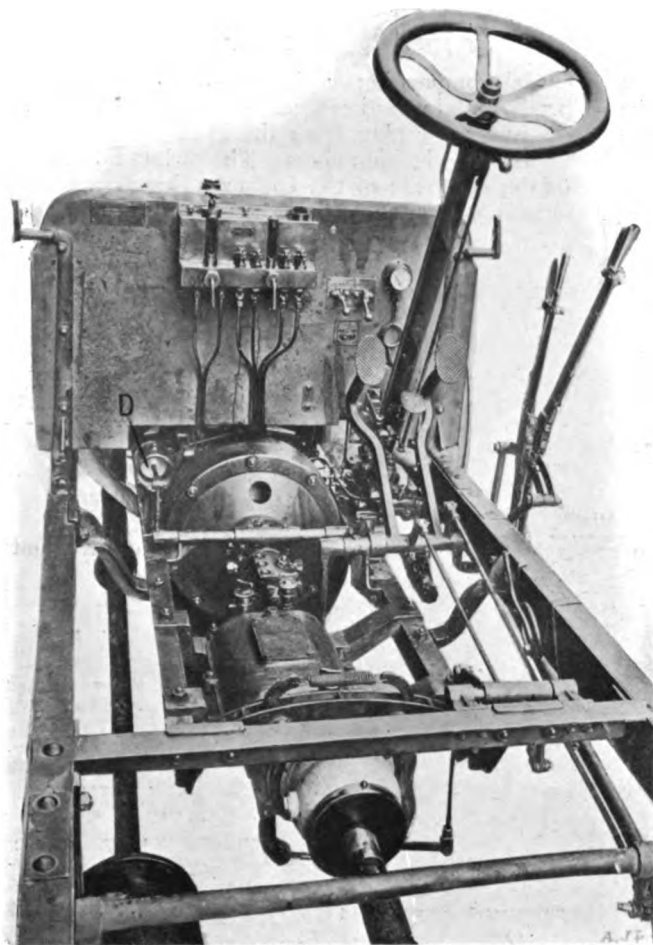


Fig. 6.—Rear view of the 20-24-h.p. Simms chassis, showing the dash-pot, D, which is inter-connected with the clutch-operating gear.

stationary. There is, in addition, an auxiliary air-port, A^{10} (Fig. 4), but this is regulated by hand from a lever on the dash. The throttle-valve, A^9 , is situated at the top of the induction-pipe, and is interconnected with the governor, C, through the lever, C^1 , as well as with a hand-lever on the steering-pillar and an accelerator-pedal. The mixing-chamber is jacketed so that it may be heated by the exhaust-gases.

The cooling water is circulated through the cylinder jackets by a gear-driven centrifugal pump, and the radiator, behind which is a belt-driven fan, is constructed of horizontal finned tubes. The clutch is of the internal cone type, and the inner member is leather faced. In order to reduce its "fierceness," by preventing the friction surfaces from coming into contact too suddenly, a dash-pot, D (Fig. 6), is interconnected with the clutch mechanism. The dash-pot is quite a simple device and merely consists of a close-fitting plunger which works in a cylinder having one end closed.

Disengaging the clutch, forces the plunger into the cylinder, and the plunger drives out the air in front of it through a small needle-valve. When the clutch-pedal is released, the action of the clutch-spring tends to draw the plunger out again, and this causes a partial vacuum to be formed in the dash-pot cylinder. The clutch-spring is therefore unable to act as rapidly as it otherwise would. The effect of the dash-pot may be regulated by adjusting the needle-valve.

The bronze gear-box (see Fig. 7) has a detachable inspection-cover. The sliding member, E^1 , is mounted on the squared driving-shaft, E, and a direct drive on the top speed is obtained by a jaw-coupling, the two engaging members of which are on the sliding member, E^1 , and the driven shaft, E^2 , respectively. When the top speed is in use, the lay-shaft does not revolve, because the act of engaging the jaw-coupling automatically disconnects the wheel, E^6 , from the driven shaft. The lay-shaft is carried in solid-ended steel bushes, E^5 , at either end, and the gear-wheels on it are each formed with jaw members which engage with corresponding jaws on the tubular distance pieces, E^4 , between them. There is, therefore, no need to pin the wheels to the lay-shaft itself because they virtually form, with their distance pieces, a solid member in themselves. The "reverse" is obtained, in the usual way, by the use of intermediate spur-wheels, E^6 , which lie below the main shaft.

Immediately behind the gear-box is the drum, F, for the foot-brake, and the universal joint, G, for the propeller-shaft. The foot-brake is interconnected with the clutch, so that the latter is automatically disengaged when the brake is put on. The universal-joint, G, for the propeller-shaft is provided with an aluminium cover, G^1 , which is fixed to the face of the brake-drum, F, and serves to retain the lubricant, and also to exclude the dust. The propeller-shaft is enclosed in a stationary tube, which, being bolted to the back-axle casing, acts as a torque rod.

(To be continued.)

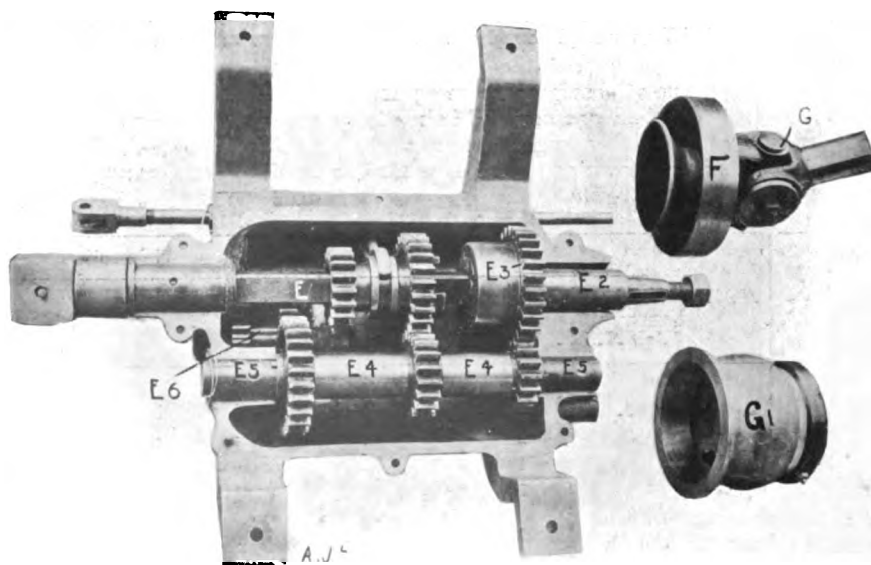


Fig. 7.—View of the Simms Gear-box, showing the brake-drum, F, and the cover, G^1 , for the universal joint, G.

THE LATEST NAPIER CARBURETTOR.

THE accompanying illustrations give an excellent idea of the carburettor which the Napier Company are now fitting to all their cars and marine engines, this being the type employed on the 18-h.p. car with which Mr. Cecil Edge has been so successful in recent fuel-

may be present in the petrol, are retained beneath the gauze-filter, and can be allowed to escape by removing the drain-plug, B⁴.

Surrounding the spray-jet, in the mixing-chamber, D, is a hand-controlled throttle-valve, D¹, which not only regulates the passage of the explosive mixture to the second throttle-valve, E, but simultaneously controls the air supply to the mixing chamber. The valve, D¹, which is cylindrical, has its ports so shaped that the richness of the mixture is, in consequence, kept approximately constant; the port communicating with the second throttle-valve is most prominent in Fig. 2. This throttle-valve, D¹, is regulated by a hand-lever on the steering-pillar. The whole of the air enters the carburettor at D².

The second throttle-valve, E, is connected with the centrifugal governor on the engine, and is, therefore, automatically closed when a certain speed has been attained; it is also inter-connected with the accelerator-pedal on the car, so that the normal speed can be varied.

This valve, E, consists of the two concentric sleeves, E¹ and E², the former being secured to the rod, E³, and the latter being bolted to the carburettor. The ports in the outer sleeve, E², are closed by the inner sleeve, E¹, when the governor comes into action. The induction-pipe is connected to the carburettor at E⁴.

The entire apparatus is, it will be noticed, as simple as it is effective.

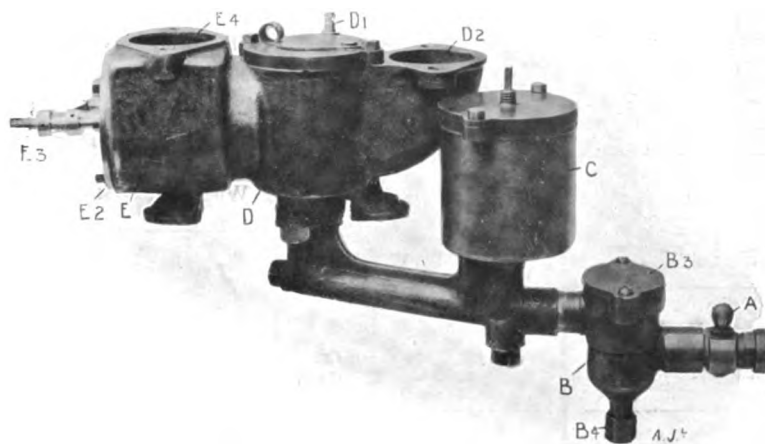


Fig. 1.—The 1905 Napier Carburettor, fitted with hand and governor-controlled throttle-valves.

consumption trials. Fig. 1 is a complete view, and in Fig 2 some of the chief parts are seen separately.

The petrol, on its way to the float-feed-chamber, C, passes through the cock, A, and the filter-fitting, B, the latter containing the gauze-filter, B¹, that is held down in place by the spring, B², and the cap, B³. In this manner, any water, or any foreign substances which

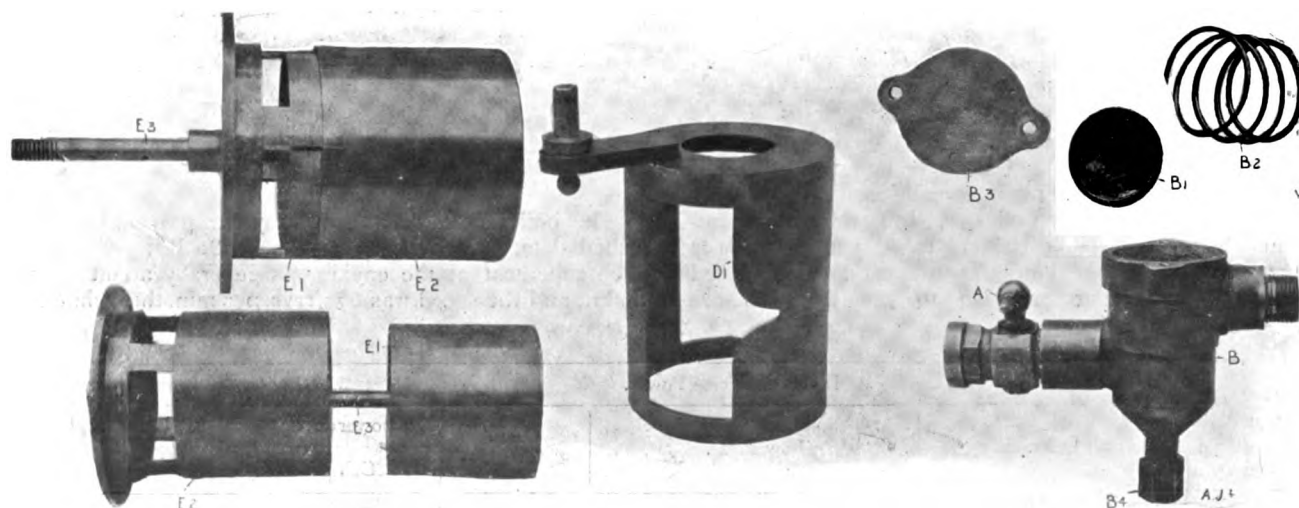


Fig. 2.—The Napier Carburettor. Two views of the governor-controlled throttle-valve, together with views of the hand-controlled throttle-valve, and the fuel-filter.

THE pleasing spirit of independence so gloriously characteristic of our labouring classes in this free country has been forced prominently upon the attention of the Blackburn Town Council. The Council is employing a number of navvies on the sewage work some 5 miles out. Formerly the navvies had to walk the

5 miles before commencing their day's labour. Now the thoughtful Town Council employs a motor wagon to convey the navvies thither. Will it be believed that the navvies have been demanding that they should be paid for the time spent on the motor drive at the same rate as if they were labouring at the sewerage engineering works?

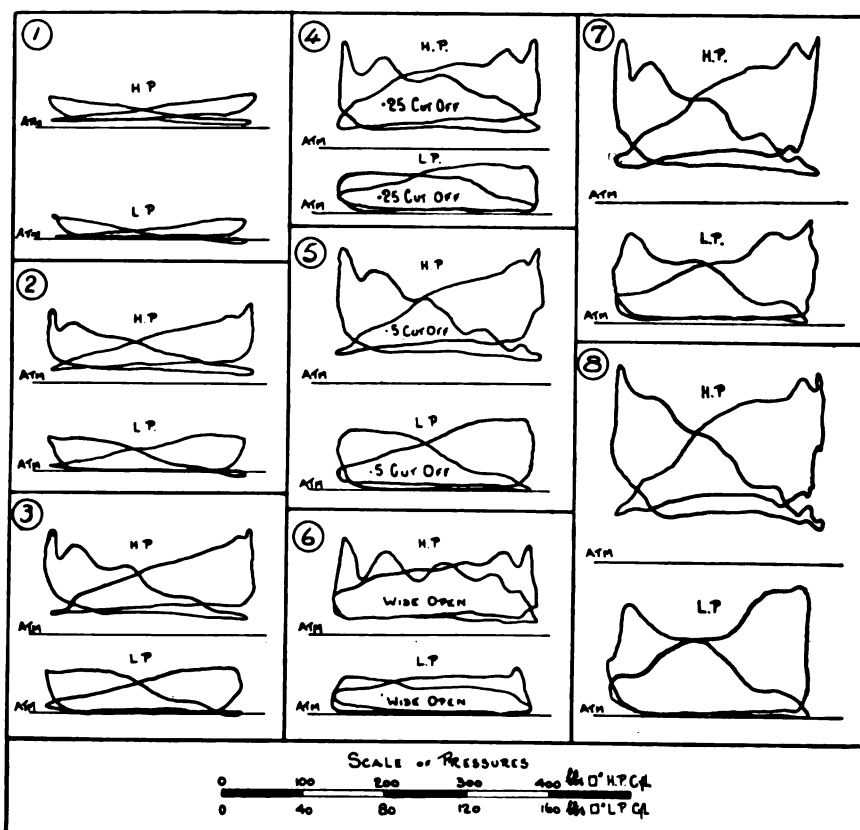
CONSUMPTION TEST OF THE WHITE STEAM SYSTEM.

THE indicator diagrams, which we give below, refer to the tests of which we published particulars in our issue of January 7th last. These tests were, it will be remembered, carried out in America by Prof. C. H. Benjamin, with a standard 10-h.p. White engine.

We were only able then to give the numerical data relating to these tests, which, as we pointed out at the time, are not only interesting to automobilists, but are of great importance to engineers generally, for they throw considerable light on the use of superheated steam for small engines, and throw a remarkable light on the efficiency of the White steam system in particular. In fact, Colonel R. E. Crompton, C.B., M.I.C.E., who sent us a communication on the subject at that time, said that he considered the results, even after deducting for errors of observation, were "so good as to show that the White engine and boiler is the most remarkable steam engine combination which has ever yet been tested in an authoritative manner." It is with great pleasure that we now take the opportunity of supplementing the information which we then gave.

This very interesting series of indicator diagrams will be found to afford a considerable amount of additional information. Eight separate tests are represented, and these range from "no load" to "full load." The diagrams themselves show perceptible signs of vibration on the indicator, but this is, unfortunately, unavoidable when using any ordinary instrument of this kind for indicating high-speed engines. Particulars relating to the diagrams are

given in the accompanying table, the i.h.p. and b.h.p. figures having been worked out by Prof. Benjamin, and the percentages having been added by ourselves.



Indicator Diagrams taken from a 10-h.p. White Steam Engine, running at 675 revs. per min. The boiler pressure and other numerical data relating to the conditions of the tests were published in our issue of January 7th last.

The boiler pressure, as given by our previously published data, varied between 250 and 380 lbs. per sq. in. The superheat at the engine was generally about 300° Fahr., and the speed was 675 revs. per min. throughout.

No.	Indicated Horse Power.									B.H.P.	Mech. Effy. %.
	High Press.			Low Press.			Grand Total.	% of power developed in			
								H. P. Cyl.	L. P. Cyl.		
	Top.	Bottom.	Total.	Top.	Bottom.	Total.					
1	.469	.417	.886	.430	.256	.686	1.572	56	44	Nil	—
2	1.236	1.00	2.236	1.025	.918	1.943	4.179	54	46	2.4	57.5
3	1.53	1.701	3.231	1.292	1.398	2.690	5.921	54	46	4.66	78.5
4	2.295	2.38	4.675	1.57	1.82	3.39	{ 8.065 .25 cut off }	58	42	6.92	{ 85.5
5	2.12	2.35	4.47	1.915	2.5	4.415	{ 8.885 .5 cut off }	51	49		{ 78.0
6	2.38	2.31	4.69	1.52	1.755	3.275	{ 7.965 wide open }	59	41		{ 87.0
7	2.59	3.09	5.68	2.33	3.14	5.47	11.15	51	49	9.15	82.0
8	3.02	3.18	6.20	3.18	4.32	7.50	13.70	45	55	11.4	83.0

REVIEWS OF BOOKS.

"The Irish Motor Directory, 1905."

(Dundalk: W. Tempest. Price 1s.)

THIS is an exceedingly useful little publication. It contains the Motor Car Acts and Board of Trade Regulations, with a lot of miscellaneous information, amongst which are a number of receipts for first aid in the case of the various types of mishap from which the motorist is likely to suffer. Considering the large number of promiscuous and ill-regulated towsters that infest every Irish village (due to the dog licence in the Emerald Isle being only half a crown) it is not unnatural that some space is given to the proper treatment of dog bites. Being published in Ireland there are of course no directions for dealing with snake bites. The directory contains a very remarkable innovation in motoring publications, which we have never seen before. It is nothing less than a copy of the register of all the cars registered in the Island, with the names and addresses of the owners against their identification numbers. Considering that in this country the authorities do not permit the inspection of registers owing to the distinct abuses, blackmailing and the like, which might result, we think it may be taken as a distinct compliment to the good feeling of all classes in Ireland that this publication has been permitted, though how far the few English automobilists who, from sympathy or other reasons, happen to have registered their cars in Ireland appreciate it is another matter.

"British Motor Tourists' A.B.C."

(London: British Motor Tourists' A.B.C. Company, 30, Fetter Lane. Price 1s. net.)

THIS is a useful and handy book of reference, giving the principal hotels, storers of petrol, repairers, tyre keepers, and other similar information required by automobilists, for all the principal towns and villages in England and Wales, with some miscellaneous legal information added, and a list of automobile clubs, hunting centres, and race fixtures for 1905.

"Duryea Power Carriages. What to Do and How to Do It."

(Coventry: The Duryea Motor Company. Price 1s.)

THIS little pamphlet, as its name suggests, is of course mainly intended for owners of Duryea vehicles, but it contains a considerable number of useful hints for any amateur who is beginning to learn car driving, and is couched in such a way that those who follow its precepts are certain to join the sensible and thoughtful majority of car drivers, and are never likely to degenerate into scorchers or reckless "corner-shavers." As an instance of the kind of precept inculcated, we cannot do better than quote the following:—

"Be particularly careful when going round corners, especially sharp ones. Always sound your horn or bell as you approach the turning to warn people on the other side. Remember, although you cannot see or hear them, there may be somebody on the other side filling up practically the whole roadway—a donkey and cart, timber waggon, or children at play, for instance—and if you are travelling at more than ten or twelve miles an hour, it is a physical impossibility to stop the car under several times its own

length. Never "cut" a corner on your wrong side, there may be another car coming the other way, and you would meet it end on. No driver ought to allow less clear space to be in front of him at any time than he knows he can pull up dead in, considering the speed at which he is travelling.

The little work also very sensibly expatiates on the value of care and consideration from the car owner's own point of view, the extent to which it spares the machinery, and above all economises tyre expenditure. The pamphlet will prove of use to others besides Duryea car-owners, and is sold to the general public at the price of 1s. The amateur who is learning the rudiments of car driving, no matter what his car may be, could hardly expend a shilling better than in its purchase.

Some Useful Guides.—Spring brings its prospect of extended tours, and with it comes the usual crop of guides and maps, which are so useful to those on pleasure bent, in helping them to decide on the best, shortest, or most picturesque routes for their journeys. Among such little books recently received by us are four deserving of special mention, viz., "Throupe's North of England Guide" (T. Throupe, Bradford, 6d.); "Bacon's Road-Book for England and Wales" (G. W. Bacon, London, 6d.); "'Swift' Road-Book of England and Wales" (Swift Cycle Company, London, 1s.); and "Road Guide to Bristol" (W. C. Hemmons, Bristol, 3d.).

The first and second of those mentioned belong to well-known series. "Throupe's Guide" is partly of a descriptive character, is well compiled, and contains really instructive information for the tourist who occasionally cares to leave the high road. At the same time, however, the section dealing with routes and distances has not been neglected. The mileage tables are very complete, and there is a good map on a scale of six miles to the inch, which includes York, Leeds, Lancaster, Barrow, Cockermouth, Penrith, and Middlesbrough.

"Bacon's Road-Book" is, on the other hand, entirely restricted to data concerning routes, of which no less than 423 are included. The map, although drawn to a scale of nearly 40 miles to the inch, is remarkably clear, and a commendable feature in the "get up" is that the map is in two sections, north and south of Peterborough respectively, and each sheet is, in consequence, only folded in one direction. References are made to the principal hotels, and also to the leading cycle or motor agent in the more important towns; while a very complete index to places is to be found at the end of the book.

"The 'Swift' Road-Book" is another compilation of principal routes, and although it is prepared on a larger scale than the book just referred to, it is, nevertheless, far from being too bulky for the pocket. The various routes are given in great detail, and with considerable attention to the turnings. The map is fairly clear, but might with advantage be constructed in sections. The information set forth in the pages of the little book is well arranged, and unusually complete.

"The Road Guide to Bristol" is of a miscellaneous nature, it contains particulars of the principal routes around Bristol, and gives information about the chief attractions in the various towns, while notes regarding fishing rights, and dark rooms for photographic purposes are also included. There is one general map taking the whole of Wales and the south-west coast, and in addition there are a number of sectional route maps and contours.

MR. GLIDDEN'S ROUND THE WORLD TOUR.

A RECORD OF RELIABILITY AND ADVENTURE.

MR. GLIDDEN is back again in London, and we had the good fortune to interview him soon after his return. He looked none the worse for his long journey and adventures in many lands—a bit sunburnt and weather-beaten, but a testimonial to the health-giving properties of an extended motor tour. He has been a greater distance than is required to actually circle the globe as the crow flies, or would fly if it could perform the feat, for the total mileage he has covered in different countries, as far apart as Ireland and Australia, comes out at 25,100 miles. He has been through 24 different countries altogether, and in all this long tour he has only been kept waiting by car troubles a total period of one hour! Tyre troubles he seems practically not to have had, but this is due to the regularity with which he has invariably changed his Dunlop tyres, making it a rule to put on new tyres on the driving wheels whenever they had covered 2,000 miles, and new tyres on the steering wheels as soon as they had covered 6,000 miles. We have chronicled his adventures from time to time, and our readers will recollect that he has not only been further north than any motor car has ever been before, but likewise traversed the southernmost road in the globe. Though the roads in places were such that Mr. Glidden often sighed for the comparative comfort of a ploughed field in the old country, he is nevertheless enthusiastic as to the enjoyment of round-the-world touring as a pastime. For educating a man as to what the world is like, and what the different peoples in it are doing, a round-the-world motor tour, he thinks, has not its equal. Indeed, he believes that, before long, tours of the kind will become the regular pastime of the well-to-do motorist.

That may be the case. But those who come after Mr. Glidden will hardly be able to enjoy *his* pioneer experiences. Nor will they be able to boast, in all probability, of having taught two Kings to drive, and taken several others a-motoring. What perhaps has impressed Mr. Glidden as much as anything is the extent to which the motor car has already found its way to the most inaccessible districts. But there were places where his car was the first that had ever been seen. Fiji was one of these—*islands* which, not many years ago, were a stronghold of cannibalism, and where Mr. Glidden had the pleasure or honour (we are doubtful which it should be called) of giving a drive to an elderly gentleman who admitted that he had taken part in no less than 47 different banquets in which the flesh of *homo sapiens* was the *pièce de résistance*. This representative of a now extinct *cuisine* surveyed Mr. Glidden's ample proportions with nearly as much interest as he bestowed upon the car, and Mr. Glidden believed that much as he liked riding in that vehicle, the elderly Fijian would have even more preferred to see its owner

nicely roasting. The King of Fiji, Ratu Kadavu Levu Roko Tui Taileon, however, is a fine up-to-date ruler, and anxious to lead his people the way they should go—away from cannibalism and towards automobilism—and to this end he took several runs with Mr. Glidden, himself occupying the seat in front, the greater part of his extensive name being packed into the tonneau behind him. King Ratu Kadavu Levu Roko Tui Taileon is likely in the future to be a votary of high speed, as he wished to know whether Mr. Glidden could go at 60 miles an hour, and was much disappointed when he found he could not. The natives of Fiji, on the landing of the car, were greatly terrified, and roundly declared that "The Father of all Devils" had come amongst them, and the name that they bestowed upon the conveyance was "The Father of the Host of Satan," only they did not pronounce it that way.

There seems to be nothing like out-of-the-way islands for producing monarchs with lengthy names, and in Java, into which island, as we narrated last week, Mr. Glidden had great difficulty in entering, he made the acquaintance of a monarch rejoicing in the name of S. P. J. M. Toean Soesoehoenan Pakoe Boewono Soerkarta Adinigrant. The Court etiquette of this Sultan of Java, as described by Mr. Glidden, reminds one of some of the sarcastic passages in "Gulliver's Travels." When the King walks in to an audience, the courtiers crouch down on their heels, waddling along behind His Majesty as if executing a sort of hornpipe. After the audience, the travellers were entertained by a Court dance of all the Princesses, which lasted for an hour and a half, after which Mrs. Glidden had a private audience of the Queen. Like the other potentates, the Sultan of Java took an outing in the Napier. The King was determined to ensure his own safety, and he did so by loading up the car not only with himself, but with his Queen and one of his daughters, two other wives, the Assistant Dutch Resident, and the Royal umbrella-bearer. As in various other countries, the umbrella is an indication of elevated position, that of the Sultan being made of gold. After these precautions the Sultan's command to go slowly was rather superfluous, but the Napier stood the trial well, and the King and his golden umbrella-bearer survived the ordeal.

Mr. Glidden is enthusiastic about the possibilities of motor car driving on railways. As our readers will remember, he crossed Canada on the Pacific line. When he first started he was made to run behind the expresses, but subsequently it was found that he could keep well in front of them, and after this he was allowed to precede them. In fact, Mr. Glidden is convinced, as the result of his experience, that one form which the locomotion of the future will take, will be on railway lines, either specially constructed for the purpose or those at present existing, every man, in fact, constituting his own train.



ALTHOUGH the proposition to allow the Sussex Motor Road Company to bring their omnibuses from Worthing to a terminus on King's Road, at Waterloo Street, Brighton, has again been defeated, the Town Council have now granted to the Worthing Motor Omnibus Company permission to run their vehicles into Hove by Church Road, which runs parallel with the front.

THE dust-laying experiments which have been conducted on the main road between Hythe and Folkestone are reported to have proved a success. The area treated with the tar solution was 5,288 square yards. The cost of this is reported by the surveyor to be a little over £30, equal to 1'38d. per square yard.

RACES, RECORDS, AND TRIALS.



ISLE OF MAN ELIMINATING TRIALS.—An example of the keen interest taken in the cars. One of the Napiers waiting in control.

The Filey Meet.—In fine weather no motoring event can have a more delightful venue than the seaside, and Whit Monday at Filey was fine beyond the dreams of motorists who have lately been residing in more southern districts. The day was ideal for such an event as that which was organised by the Yorkshire A.C. to take place on the Filey Beach during the afternoon of June 12th.

Filey is a quaint little place, mostly patronised by those who know of its advantages as a quiet resort. There was nothing quiet about Filey on Monday, however, and it is probable that at no time has the little town been the centre of so much life and bustle as prevailed during the Whitsun holiday.

The pity of it was, however, that the events themselves were disappointing, several elements conspiring to rob the meeting of the smoothness which is essential to unqualified success. Too much confidence was evidently placed in the sands of which Filey Beach is composed and, unfortunately, some unknown factor caused them to be left by the ebbing tide in anything but a perfect condition.

The spectators, too, were very much to blame in not allowing themselves to be kept in order by the fishermen who were entrusted with this duty. The supervision of some ten thousand determined sightseers stretched over about a mile and a half of seashore was, not unnaturally, beyond the capabilities of the well-meaning but indulgent "course-keepers." There was originally a line, ploughed deep in the sand, over which all unauthorised persons stepped at their peril. The unauthorised persons, however, appeared to be willing to risk it, and after obliterating the "side line" with their feet, many of them took an airing on the track, indifferent alike to the warnings of the officials and the dictates of their own common sense—if they had any. Indeed, so bad did this disregard for the rules become that Mr. Cecil Edge expressed his unwillingness to again drive his racer under such conditions, and another course was selected nearer the water's edge, on which Mr. Cecil Edge made his third successful attempt to lower the "Yorkshire record," established last year by Mr. H. R. Kirk of Leeds.

In all there were eight distinct events, of which the first five were open only to the members of the Yorkshire A.C. and affiliated clubs. The contests were devoid of incident, and it was obvious, too, that the spectators were far more interested in the event for racers—in which the speed was visible, so to speak—than in any of those in which merely touring cars were the participants. This lack of real enthusiasm was hardly to be wondered at in view of the fact that nobody could answer "who's won?" until quite late in the evening. This is, unfortunately, a disadvantage common to all speed events which are run against the clock, and the spectators, who are unable to find out how affairs are progressing, lose interest accordingly. Even in the racing car event they were doomed to disappointment because neither the Hon. C. S. Rolls, who had brought over an 8-cylinder Dufaux, Mr. Clifford Earp, with the 6-cylinder Napier, nor Mr. A. Rawlinson, with his Darracq, turned up. The following are the classified results:—

Class A. (Whiteman Cup):—

A. Masser, 6-h.p. De Dion, 2m. 39½s.
W. R. Booth, 8-h.p. De Dion, 2m. 49½s.

Class B. (Gold Medal):—

F. Churchill, 12-h.p. Hallamshire, 2m. 10½s.
T. Whitaker, 12-h.p. Lancaster, 2m. 22½s.

Class C. (Rowland Winn Cup):—

A. H. Walker, 15-h.p. Darracq, 1m. 42½s.
Hon. C. S. Rolls, 14-h.p. Minerva, 1m. 5½s.

Class D. (Sheffield Telegraph Trophy):—

F. Churchill, 24-h.p. Hallamshire.
A. Elsworth, 24-h.p. Spyker.

Class E. (H. R. Kirk Trophy):—

A. Farvell, 30-h.p. Daimler, 1m. 21½s.
H. Walker, 30-h.p. Darracq, 1m. 47½s.

Class F. (Gold Medal):—

C. Edge, 90-h.p. Napier, 50½s.
H. Walker, 70-h.p. Darracq, 57½s.

Class G.:—

H. Johnson, 24-h.p. Fiat, 1m. 35s.
A. Elsworth, 24-h.p. Spyker, 1m. 41½s.

Class H.:—

Cecil Edge (walk over), 1m. 3½s.

The course was 1 mile in each event.

Bexhill Race Meeting.—On Wednesday last, under the auspices of the A.C.G.B.I., the annual speed trials on the private track at Bexhill were held. The classes were arranged differently this year, and no cars below £350—price of chassis—were admitted, although there were two events for motor cycles. Sixty-three entries were received, and several of those which turned up made very good times. The event took place in glorious sunshine, made more delightful by the tempering coolness of the breeze. As last year, the start took place from the Sackville end, and the cars had in consequence to negotiate the sharp rise at the other end.

The following is a list of the classes and the times, for the standing kilometre, of the respective winners in each final :—

Tourist Section.

Class A.—Motor cycle handicap (cylinder capacity, 80 × 80).—1st, No. 5, W. W. Genn (2½-h.p. Minerva); time 1m. 24s.

Class B.—Motor cycle handicap (cylinder capacity, 85 × 85).—No entries.

Class C.—Cars (£350 to £650 chassis only).—1st, No. 11, J. McDonnell's 28-h.p. Daimler, driven by A. H. Bush; time 55½s.

Class D.—Cars (£650 to £900 chassis only).—1st, No. 35, Percy Martin's 30-h.p. Daimler, driven by himself; time 50½s.

Racers.

Class E.—Motor cycles not exceeding 110 lbs.—1st, No. 45, H. H. Collier's 7-h.p. Matchless, driven by E. R. Collier; time 54s.

Class F.—Cars under 650 kilograms.—No entries.

Class G.—Cars not exceeding 1,000 kilograms.—1st, No. 51, A. Lee Guinness's 100-h.p. Darracq, driven by himself; average time for three runs, 31½s.

Tourist.

Class H.—Sweepstake (£1 each) open to cars of Classes C and D. Winner takes 80 per cent., and the second 20 per cent. (twelve entries).—1st, No. 58, F. Coleman's 15-h.p. White steam car, driven by himself; 2nd, No. 57, C. S. Rolls and Co's., 15-h.p. Orleans, driven by Claud Johnson.

No times were given for this event.

Auvergne Circuit.—As we hoped, the foreign competitors are to have the opportunity of practising on the circuit after the French Eliminating Trials. It is to be again opened to racing cars, commencing to-morrow (Sunday).

LOUIS CHEVROLET, on Saturday last at Morris Park, New York, driving his Fiat car, covered the mile in 52½s., beating his own previous record of 52½s. At the same meeting, in the 5-mile National Circuit, Chevrolet was first on his Fiat in 4m. 48½s.

Milan Tourist Trial.—In our issue for June 3rd we gave the results received by telegraph of this Italian contest. We did an injustice to a very excellent car, viz., the 40-h.p. Züst, which ran in Class II. (chassis 14,000 francs, 900 kilom. circuit). This vehicle, driven by the Marquis Ginori, of Florence, secured the first prize, a cup presented by H.M. the King of Italy, the 24-h.p. Fiat of the Marquis Ferrero being awarded the Confatonieri Cup in this class. The Züst car is at present better known in Italy than in this country, but we understand that shortly there will be several of them running in England.

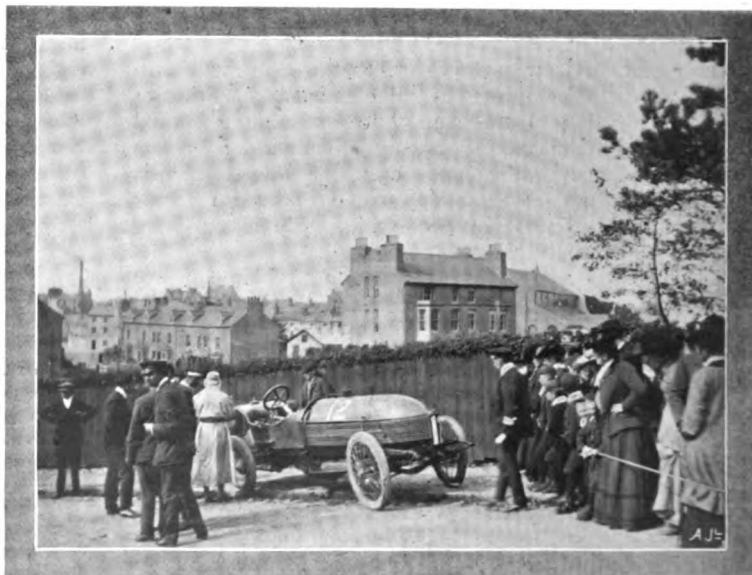
Market Rasen Hill-Climb.—In connection with Mr. A. A. Padley's invitation meet at his place, Hill House, Market Rasen, a hill-climbing competition was held on Thursday last at Bully Hill, a steep hill about four miles out on the Benbrook Road, the scene of last year's climb. The hill is 973 yards in length, and rises in that distance 245 feet, with a length of about 80 yards of 1 in 6, on which the full force of the high wind was felt. Three cars came to a standstill at the bend, but chocks had been provided, so there was no risk. The arrangements were really excellent, and reflect the greatest credit on Mr. Padley, who organised them, and to Mr. W. B. Jevons, who, as clerk of the course, carried them out. Mr. W. Seagreaves Lissington was starter, Mr. T. E. Foster, N.R.R.A., and Mr. W. Mansell, N.C.V., Lincoln, were timekeepers, and Mr. W. B. Jevons with Capt. H. E. Newsum and Mr. W. R. Pennell, Lincoln, were the judges to decide the two most meritorious performances. The first prize was a motor timepiece, and the second a motor kit, both presented by Mr. Padley.

The performances and placings were as follows :—

	Owner and Car.	Passen- gers.	Time.	
			m.	s.
1	Mrs. Chambers, Lincoln (Mr. C. W. Pennell driving) (14-h.p. Martini)	4	1	28
2	Mr. W. T. Gent, Misterton (9-11-h.p. National)	4	2	28
3	Mr. W. S. Foster, Lincoln (24 h.p. Georges-Richard)	4	1	53½
4	Dr. P. Sharp, Lincoln (12-h.p. Richardson)	4	2	52
5	Mr. T. W. Swaby, Grimsby (12 h.p. Darracq)	4	2	42½
	Mr. R. M. Wright, Lincoln (8-h.p. Wolseley)	5	3	10½
	Mr. A. Robinson, Grimsby (8-h.p. De Dion)	2	3	21½
	*Mr. W. Nissler, Lincoln (8-h.p. De Dion)	2	3	52
	*Dr. Miller, Wrangle (7-9-h.p. Peugeot)	4	4	53
	*Mr. C. Pratt, Lincoln (7-h.p. Panhard)	4	—	—

* Stopped on bend.

MONT VENTOUX HILL-CLIMB, originally fixed to take place on August 27th, has been now definitely postponed until September 2nd and 3rd.



ISLE OF MAN ELIMINATING TRIALS.—The 6-Cylinder Napier Car immediately after Macdonald met with his unfortunate accident in the Gordon-Bennett Eliminating Trials recently. We are indebted for our photograph to Mr. A. Hoffmann, who points out that the damaged wheel suffered very little considering the force of the impact, showing the wonderful strength of well-made wire-spoked wheels.



ISLE OF MAN ELIMINATING TRIALS.—At Ramsey. How the cars were "refreshed" en route. No. 4, 90-h.p. Wolseley, in the left picture, No. 1, 70-h.p. Star, in the right picture.

Voiturette and Car Trials—The rules governing the three events, announced some time ago, organised by *L'Auto* for (1) Voiturettes, (2) Light Cars, (3) Cars, have now been issued. They are to take place in September next and thereafter annually. For each of the trials a distance of about 1,200 kiloms., divided into six stages of 200 kiloms. each, are to be covered in six consecutive days. Manufacturers only, of any nationality, can enter cars, and each manufacturer can only enter a maximum of three vehicles of the same type in each of the events. For each class entries must comply with the following requirements:—

Voiturettes.—(1) One cylinder of a maximum capacity of 1 litre. (2) Weight of chassis, between 350 and 500 kilogs. (3) Minimum weight of carriage body, 50 kilogs. (4) Seating capacity for two persons.

Light Cars.—(1) One cylinder, with a maximum capacity of $2\frac{1}{2}$ litres. (2) Weight of chassis, between 600 and 850 kilogs. (3) Minimum weight of carriage body, 100 kilogs. (4) Seating capacity for 4 persons.

Cars.—One cylinder, with a maximum capacity of $3\frac{1}{2}$ litres. (2) Weight of chassis, between 850 and 1,100 kilogs. (3) Minimum weight of carriage body, 150 kilogs. (4) Seating capacity for 4 persons.

All cars must be of recognised tourist type, and carriage bodies must be complete and finished in all cases. Entries close September 1st at single fees, 100 frs. for voiturettes, 150 frs. for light cars, 200 frs. for cars, this fee including fire insurance in the closed garages.

The classing will be based upon (1) regularity, (2) speed on hill, (3) speed on the flat, (4) starting on hills, (5) brake power. The following methods will be adopted when judging the cars under the above headings:—

Regularity.—This will be checked at certain points selected by the officials, but unknown to the competitors.

Voiturettes will be required to make a mean speed of 20 kiloms. per hour, light cars 25 kiloms. per hour, and cars 30 kiloms. per hour.

Every day at the start each vehicle in each class will be credited with 200 points, which will be subject to the following deductions at the end of the run:—One point will be deducted for each kilom. per hour (or fraction of same) by which the average speed of vehicle (calculated

between each successive control) differs from that imposed by the regulations.

Speed on Hill.—The car making the best time over 1 kilom., up the selected hill, will receive 200 points. Other cars will be debited with two points off this maximum for each second by which their time differs from that of the fastest.

Speed on the Flat.—The same distance and rules apply as for the speed on hill.

Brake Test and Starting on Hills.

—Both these tests will be conducted over a distance of half a kilometre. The fastest car covering this distance (starting from rest and finishing at rest) will receive 200 points. Other cars will be debited 1 point for each fifth of a second that they exceed the winner's time.



In the above picture we show a reproduction of the design for the 100 guinea cup presented by the Continental Tyre and Rubber Company to the winner of the Tourist Trophy Race, of which we announced particulars recently. This cup has been designed by Messrs. Elkington and Co., and promises to be a very beautiful trophy. The picture of the touring car in the front of the cup will be in repoussée and the finished cup will embody the design of the car of the winner. The extreme width of the cup will be 1 ft. 9 in., and the height 3 ft. 4 in.

Coupe Rochet-Schneider.—Last week this interesting Continental inter-club event for tourist cars was held near Zürich, as the holders of the Cup for last year were

position. There were 14 starters, of whom 11 were classed. The test is over 300 kilometres on a course of a very severe nature, and the results are based on regu-

	Weight.	Price of Chassis.	Regularity.	Average Speed.	Water.	Hill Speed.	Consumption.	Total.
	Kilogs.	Francs. Points.	Points.	Kiloms. Points.	Points.	Kilos. Points.	Litres. Points.	Points.
1. 18-24-h.p. Peugeot, L. Perret (A.C. Rhone)	1,474	15,000 160	300	30 200	100	31'07 200	41'9 200	1,160
2. 16-20-h.p. Rochet-Schneider, A. Mahler (A. C. Rhone)	1,356	14,500 165	300	30 180	100	27'11 200	39'00 189	1,134
3. 30-40-h.p. Martini, M. Martini (A. C. Switzerland)	1,665	18,500 125	300	30 200	100	39'25 200	55'65 199'6	1,124'6

the Swiss Club, M. Martini, with a Martini car, having secured it for them in 1904. This year it has changed hands and gone back to the A.C. de Rhone, M. Perret, with an 18-h.p. Peugeot, having secured the premier

larity of running, speed on the hill, average speed, fuel and water consumption, and price of chassis. Details of these points of the three leading cars are given above.



CLUBS AND ASSOCIATIONS.

Ladies' A.C.—Owing to the execrable weather the Ladies' Automobile Club meet—which had been announced for June 7th—was at the last moment abandoned. Fourteen cars did, however, put in an appearance in Battersea Park, and four of them went on to Hurlingham for tea. A hundred cars had been expected, and—if the sun had only come out—the club muster under Battersea Park's green trees would have been a pretty sight.

The following, with one exception in covered cars, were to be seen in the Park:—

Mrs. Forster Bowen, on an 18-h.p. Daimler; Mrs. Campbell, 28-h.p. Mercedes; Lady Edward Spencer Churchill, Daimler; Mrs. Guy Hardy, 10-h.p. Panhard; Mrs. Ashton Jonson, 15-h.p. White steam car; Mrs. Gerard Leigh, 25-h.p. Charron; Mrs. Manville, 16-h.p. Daimler; Mrs. Mark Mayhew, 18-h.p. Peugeot; Lady Cecil Scott Montagu; Lady Maud Parry, 12-h.p. Gladiator; Mrs. Bruce Porter and the Misses Honeyman, on a 14-h.p. Daimler; Lady Beatrice Rawson, 18-h.p. Peugeot; Mrs. Wilkins, 16-h.p. Daimler; Mrs. Wightwick, 20-h.p. Dennis.

Lady Edward Spencer Churchill's car, which was driven by Lord Edward, led the four who ventured so far as Hurlingham. Lady Edward was accompanied by her daughter, Miss Churchill, and the club secretary, Miss d'Esterre-Hughes. The other cars were: Mrs. Gerard Leigh's, in which were Lady Cecil Scott Montagu and Mr. Lafone. Mrs. Wightwick's contained, in addition to Mrs. Wightwick, the Misses Donald, while in Mrs. Campbell's Mercedes were Mr. Campbell and Mrs. Rendle.

To-day (Saturday), the members have been invited to a garden party which is being given at Erl Wood, Windlesham, Surrey, by Mrs. Byron Peters, a member of the club.

On the 24th, the club has accepted the invitation of one of the vice-presidents, Mrs. Gerard Leigh, to motor to Kidbrook Park, Forest Row, Sussex, and the 8th July will see, it is hoped, many of the members at Woodhurst, Crawley, the home of another of the vice-presidents, Lady Beatrice Rawson.

The attention of members is called to the 24th June, which is the last day entries can be received

for the L.A.C. Gymkhana, to be held at Ranelagh on the 1st July.

MR. HERBERT AUSTIN, of the Wolseley Tool and Motor Company, Limited, has been elected chairman of the permanent committee of the British Empire Motor Trades Alliance.



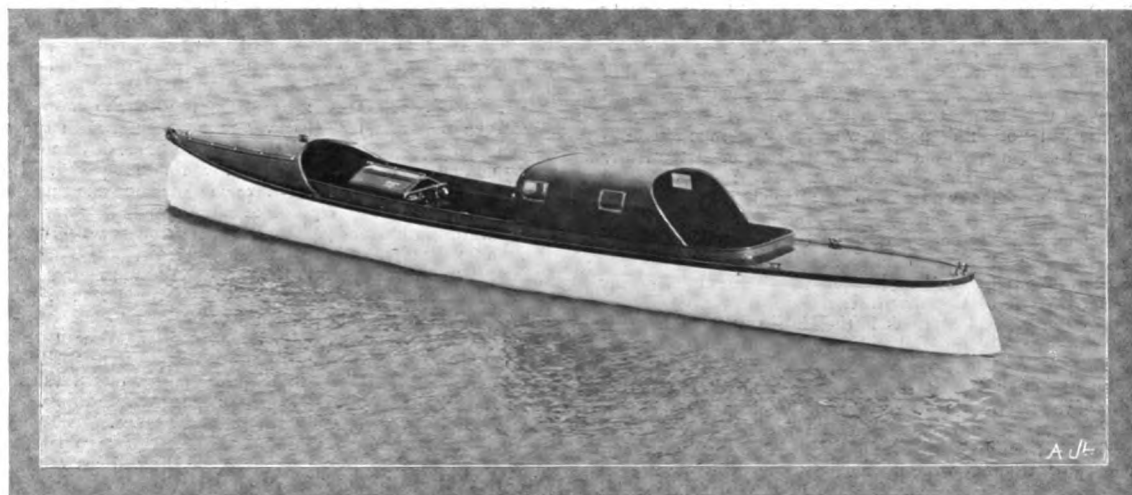
Amongst those who took part in the recent Hill Climb at Kettleby under the auspices of the Nottinghamshire Automobile Club, was the President of the Leicestershire Club, Mr. E. G. Mawbey, who has taken such an enormous interest in the movement for some time, and who has helped forward automobilism both in his own and adjoining counties. In our photograph Mr. Mawbey is, with his family, occupying his Darracq Car, just before starting for the Hill Climb. Mr. McAlpin, the Honorary Secretary of the Leicestershire Club, is standing in front of the car, whilst Mr. Booth Grainzer, the Hon. Secretary of the Nottinghamshire Club, is at the side of the front wheel, both hard-working enthusiasts in the cause.



PROBABLY the largest private owner of automobiles in the world is Baron de Zuylen, the president of the French Automobile Club. His most recent purchase is a 60-h.p. Mercedes, and during the years which have passed since the foundation of the A.C.F. he has purchased nearly 40 motor vehicles of different descriptions, of an estimated value of about 700,000 francs. His choice

has been quite cosmopolitan, and has included 20 vehicles by De Dion-Bouton, 8 Panhard-Levassors, a Peugeot, a De Dietrich, a Gauthier-Wehrle, a Serpollet, a Benz, a Jeantaud (electric), 2 Mercedes, and a Columbia. His collection ranges in power from a De Dion tricycle to the 60-h.p. Mercedes just acquired.

MOTOR BOATING.



Our illustration shows a very comfortable, though speedy, petrol launch, which has been built by Messrs. S. F. Edge, Limited, for Mr. J. R. Davies, of Bangor. The hull, which has been constructed on the Saunderson's "sewn" system, is 35 ft. long by 3 ft. 5 in. deep (amidships), and has a beam of 6 ft. 2 in. She is provided with a turtle-back deck forward, and a removable sliding hatch—with side lights—aft. The 50-h.p., four-cylinder Napier engine, and the reversing-gear, are enclosed in a neat teak casing that has plate-glass windows. This launch, we learn, is the first motor-boat to have been officially timed by the Marine Motor Association over a measured course, when, in a choppy sea, she attained a mean speed of 14.749 knots, in spite of the propeller being somewhat too small for the engine.

The Juvisy Meeting.—The first day's programme for the motor boats which had assembled on the Seine for this event included the competitions for the Coupe de Juvisy, given by Mons. H. Deutsch de la Meurthe, for racing craft of less than 8 m. in length, and the Coupe de la Seine, which is open to 8 metre boats.

From some cause or another—possibly the weather—there was a very marked falling off in the number of spectators who attended this year's meeting, as compared with the thirty thousand onlookers last year, for the crowds on the banks last Sunday numbered no more than three or four thousand at the most.

In the morning the *extra reglementaires* cruisers were dispatched from Ablon, and the *reglementaires* cruisers from Châtillon. All heats and finals were run up stream, but semi-finals were taken with the tide.

The most interesting event for the day was the contest between La Rapière and Antoinette for the Coupe de Juvisy. For the first sixty kiloms. the Antoinette kept the lead, and this secured for her owner the Coupe de la Seine, which is awarded on the result of the first 50 kiloms. of this race.

La Rapière then took the lead, and finally won by nearly four minutes. Le Dubonnet, in the other class, had no competitors, but her "walk over" was made in excellent time, and she appeared to have plenty of reserve power.

The Coupe de la Haute Seine, given by *L'Auto*, was won by "Forces Pas," and the Petite Coupe de Juvisy fell to Salangane, both these cups being for cruisers.

The second day was reserved for the speed contests over the mile and kilometre. The excitement of the day was occasioned by Dubonnet and Antoinette, which established several new records, which are given below:—

Cruisers.

Extra-Reglementaire Series.

Class I. (under 8-h.p.) distance 20 kiloms.—1st, Satyre (Frilet), De Dion engine, 1h. 16m. 6½s.; 2nd, Brimbordon (Matie), De Dion engine, 1h. 19m. 19½s.

Class II. (8 to 15-h.p.) distance 40 kiloms.—1st, Salangane (Legagneux), Panhard engine, 2h. 3m. 44½s.; 2nd, Aya II. (Fayaud), Filtz engine, 2h. 30m. 22½s.

Class III. (over 15-h.p.) distance 40 kiloms.—1st, La Nochette (Pitre), Filtz engine, 2h. 57m. 58s.

Reglementaire Series.

Class I. (under 6.5 m.) distance 40 kiloms.—1st, Delahaye V. (Blondeau), Delahaye engine, 2h. 1m. 4s.

Class II. (6.5 m. to 8 m.) distance 40 kiloms.—1st, Aya IV. (Fayaud), Filtz engine, 1h. 51m.; 2nd, Midinette (Peugeot), Tony-Huber engine, 1h. 55m. 4s.

Class III. (8 m. to 12 m.) distance 60 kiloms.—1st, Forces-Pas (Crucy), Mors engine, 1h. 55m. 43½s.; 2nd, Le Têtu (Jean), Delahaye engine, 2h. 0m. 44½s.

Racers.

Distance 100 kiloms.

Class I. (under 8 m.).—1st, La Rapière (Panhard), Panhard engine, 2h. 27m. 53½s.; 2nd, Antoinette I. (Levasseur), Antoinette engine, 2h. 31m. 38½s.

Class III. (12–18 m.).—Le Dubonnet (Dubonnet), Delahaye engine, 2h. 38m. 0½s.

Flying Kilometre and the Standing Mile (up stream).

Cruisers.

	Kiloms.	Miles.	Total.
Satyre (Frilet), De Dion engine ...	3'17½	6'51½	10'8½
Le Têtu (Jean), Delahaye engine ...	1'45½	3'54½	5'39½

Racers.

Dubonnet (Dubonnet), Delahaye engine ..	1'6½	2'29½	3'35½
La Rapière (Panhard), Panhard engine ...	1'12½	2'42½	3'54½
Antoinette (Levasseur), Antoinette engine	1'14½	2'47½	4'1½

New Records.

		m.	s.
Standing Kilometre ...	Antoinette	1	17½
Flying Kilometre ...	Dubonnet	1	6½
Standing Mile ...	Dubonnet	2	29½
Flying Mile ...	Dubonnet	2	17½

INDUSTRIAL ALCOHOL.

(Continued from page 655.)

THE HON. JOHN SCOTT-MONTAGU, M.P., said that the Irish party realise the great importance which the encouragement of potato growing in Ireland might have upon the finances of their country. There was some rather interesting evidence given by one official of the Irish Government as to potato growing there, but he did not hold out very great hopes. He said that until potatoes ceased to be eaten there he did not think people would devote much time to turning them into alcohol. That fact is at the root of the difficulty as regards the making of alcohol from potatoes. In this country where potatoes are such a valuable form of food, it will be some time before they can be produced cheaply enough to produce an amount of alcohol sufficient per ton of potatoes to justify them being used in that way. The truth is in England, with its vast towns and its big consumption, potatoes are all required, whereas in Germany they are grown in out of the way districts and it is expensive to carry them to the various markets in the large towns. Of course many people are interested in land and they are always looking for something which will make it pay better, and I feel with others that we should be all glad if by planting potatoes we could increase the productivity of the land. But I am afraid that is some way off, because at the present moment you could produce a very great amount of alcohol from maize and from grain of different kinds, and I doubt very much whether from the national point of view alcohol will have any great effect for many years to come. In Germany potatoes are practically grown on land which will not bear anything else. In this country land is much more highly cultivated than land in Germany, and every inch of land which can be cultivated by the ordinary processes of land treatment is cultivated. At present you may say that petrol is exactly half the price of alcohol. Even alcohol produced in the cheapest possible way and methylated by mineralising it could not compete with it. That is a very big difficulty to get over, and even if the surtax were withdrawn, I doubt very much whether there are more than a very few distilling plants in this country which could produce alcohol at anything like the price at which petrol might be sold to-day. It may be interesting to refer to the question of petroleum and alcohol in Germany and in France. It may be interesting to you that at the present moment in Germany, petroleum and petroleum products pay a duty of 2½d. per gallon. Yet, after that, alcohol is not used as much as petrol. If you go to Germany, or even in France, fully 95 per cent., possibly 99 per cent., of the motor cars are working on petrol, and not working on alcohol at all. And yet this is in face of the great encouragement by the Government of alcohol in all these forms, and the efforts on the part of the authorities there to induce people to use alcohol instead of petrol in every possible form. It is rather a curious fact that shortly Germany is going to reduce her tariffs on petroleum products. In March, 1900, heavy benzine, as it is called there, presumably petrol with a specific gravity of .75 at 15 degs. Centigrade, will be ½d. per gallon instead of 2½d. as at present, which shows that as far as Germany is concerned, which has tried alcohol for many purposes for which petroleum products are used, it has failed to answer all the efforts which have been bestowed upon it. Now we come to the question of France. In France, the duty on petroleum and petroleum oils is 3s. 8d. a cwt. for raw, 4½d. per gallon refined, and 3s. 8d. for what they call heavy oil. In France, almost more than in Germany, they try to encourage the use of alcohol, and to-day I think we must acknowledge the extreme ingenuity of the French automobilist there, especially in adopting all new methods that are possible, and yet there is hardly a car running in France to-day on alcohol. They are all run on petrol, although it costs more and there is comparatively a high duty in France. There is something like at the present moment on the general tariff in France, about 25 francs duty per 100 kilos., so it works out at about 9d. a gallon.

Assuming that there are 20,000 motor cars in this country to-day in use, and they run an average of 100 miles a week each. That would make a total of 5,000 miles a year each. On that basis they would use about five million gallons of petrol, which is at the rate of about 20 miles a gallon. Supposing we have the motor 'buses running in very large numbers before long, as I believe they will be, then I believe we shall have a consumption of 20 million gallons of petrol per year. Now it remains for our oil friends to tell us whether they can give us this 20 million gallons per year. I am told they can do so easily; at any rate they suggest another way out of the difficulty in case they cannot do it. They say allow us to supply you with petrol of not quite so fine a specific gravity, that is, instead of 700 to 720, let us supply you with 720 to 750, and we will undertake to supply you to the world's end. I believe that is a nearer solution of the difficulty of the short supply of petrol than the use of alcohol. One cannot help being struck with the fact that we are not going to make alcohol absolutely free. There must be

some restriction. Alcohol has got in this country to compete against petrol on an absolutely rock basis on its own merits, apart from any financial or fiscal assistance. Therefore I am inclined to think it will be a good many years before we shall see alcohol in general use for motor cars. I believe we shall improve on our carburettors for using heavier oils, that we shall use petrol of a higher specific gravity, and not care so much whether it is pure petrol or not. I believe it will go more in that direction than in the use of alcohol.

Mr. Thomas Tyrer said: I find from those who know that there would be no difficulty whatever in producing, with the existing plants and appliances in the country, a great deal more than the 20,000,000 gallons of alcohol which would be required. If that be so what is the question? I believe our esteemed chairman has used the word monopoly. We all like a monopoly if we are under the right hat or umbrella of monopoly, but, broadly speaking, monopoly is not a good thing, and the distilling industry is a monopoly; and the distiller, who is perfectly candid under the influence of a good dinner for the moment, might admit that a surtax of 5d. is one which affords him a very considerable protection. If you read this report and look at the recommendations of the committee, you will see that, as regards the industrial quantity of alcohol required, it is suggested it should be put in the same position as if the spirit was being made to be exported—a perfectly legitimate thing. It is put at 3d. Are they satisfied with that 3d.? Yes. That leaves 2d. It would not be a difficult thing, as a matter of argument, to show, because it looks very much like it, as if the real cost, the real production, and the distilling was 2d. But it means this, that on the question of cost there can be no doubt that sufficient pressure could be put upon the distilleries or the distilling industry to enforce—I say that with all respect—a concession of that kind. Dr. Thorpe wrote me a letter which proves to be very important in the light of what has happened recently. Remember from whom it came, that the services were in the habit of regarding alcohol as artificial whisky. It was not very remarkable that Dr. Thorpe should be hostile. He was hostile; he was just as hostile as any barrister holding a brief for the defence. The defence of what, gentlemen? The defence of twenty millions of revenue; and I will say that none of us, as business men, dare trifle if any such sum, or any fraction of such a sum, were committed to our care. This is a serious responsibility. It is important to be remembered that in every civilised country alcohol has been the subject of taxation more or less. It has been regarded as a subject of revenue because it was a moral question and its greatest incidence in this country was its connection with free trade. Now, gentlemen, I have no brief for the revenue, because I say that the *raison d'être* of our meeting to-night is not to renew an agitation but to continue an argument and to build up a case which under other circumstances shall be unanswerable. First, that you are prepared to meet the Fiscal conditions and the commercial conditions in the use of alcohol as against petrol with a machine which will do the work. When that is done, and I have not yet heard that it has been done completely or satisfactorily in the sense in which an engineer regards it as satisfactory, then you will be in the position to say to the Government, "help us." The Act of 1880, which describes the methods by which distillation shall be carried on in this industry, also encourages methylation. Seeing that that Act is not repealed, everything we have got to-day could have been given to us but for one reason—the work of educating up to the one point, to the needs of the country, and the business of inland revenue. The Act of 1902 remains. The British Association brought it about, but the universities and schools were given privileges for which they have not been sufficiently thankful. I have been in the North, and they have complained to me that they have not been able to get alcohol free and not denatured for the purposes of experiments and research. I cannot agree with them, why? Because the first object of the Bill was to promote research in an industrial direction. They have not been doing that. One doctor said to me that free alcohol would be a most beautiful thing in their laboratory, although they had not been using it for industrial research; yet he said all research tends to commercial industry. That is rather a broad statement. This Report shows that in the laboratories in Germany free alcohol is not allowed, therefore, you are better off here. I will conclude with simply a statement that to some extent supplements what Mr. Scott-Montagu has said. For taxation purposes in the year 1903 the consumption in Germany was 33,900,000 proof gallons; for motor and other engines, 1,100,000; for industrial purposes, 14,000,000; total 49,000,000 of proof gallons. Now, gentlemen, that shows, and I will make a public confession, I have said it privately, I myself thought that the use of alcohol in various directions was a bigger question than it now seems to be. Industrially we were not using it. For mechanical purposes, here you find in Germany its proportion was comparatively small. That is no reason why it should not increase.

(To be continued.)

MOTOR CYCLING.

ANTI-SIDE-SLIP TRIALS OF THE C.T.C.

ALTHOUGH—possibly because—all the machines which took part in these side-slip trials were man-propelled bicycles, the results obtained cannot but have a very great deal of interest for motorists, as well as for motor cyclists. When testing such devices on cars, there is always a doubt as to how far the design of the vehicle itself may be responsible for immunity from skidding, or otherwise, but with bicycles there is much less difference in this respect, and there is certainly far less uncertainty as to when skidding begins to occur. When the trials organised by the Cyclists' Touring Club took place at the Cadogan Garage in Chelsea on Tuesday last, over thirty competitors put in an appearance, and there was quite a crowd of interested spectators. A portion of the concrete yard had been covered with a mixture of Thames mud and soft soap, under the supervision of Mr. Basil Joy, and over this slippery surface the well-known secretary, Mr. E. R. Shipton, and the other officials, despatched each contestant in turn. The greasy portion was about 45 ft. long by 30 ft. wide, and each cyclist was required to take a semi-circular course over it twice in each direction, slowly during the first two trips, and subsequently at a speed of about 12 miles an hour.

Almost every conceivable kind of device was represented, though very few met with any real measure of success. None of the mechanical contrivances appeared to be of any use whatever, with the possible exception of one which prevented an absolute spill. This was a kind of two-wheeled trolley fixed beneath the bottom bracket of the frame, and, since it really converted the bicycle into a four-wheeler vehicle, it saved the rider from a fall. No small amount of amusement was caused by the evolutions made by it, for it would swing right round, come to rest, and then the back wheel would revolve at a great speed before being able to get any grip. Very good performances, however, were made with one or two of those bicycles which had special treads formed on the tyres. Particularly was this the case with Mr. G. S. Sayner's machine and with that of Messrs. Grose. The former had a kind of chain, formed of large wire links, fixed around the periphery by the inflation of the tyre, and the latter was of the well-known pattern, with steel studs projecting from a leather band. Others which proved to be more or less satisfactory were the cycles entered by Messrs. W. H. Robson, J. Kirkland and Boot and Armstrong. The first had wire volute springs fixed radially all round the rim so that a kind of resilient wheel effect was obtained, and there was no real rubber tyre of any sort; the second has tyres with numerous steel wires projecting through the covers—like a brush; and the Boot and Armstrong tyres (Wilton-Cox device), has metal bands fitted across the tyre at intervals, with studs projecting from the bands; the Robson held on the grease, but slipped on the dry concrete. Extraordinary as it may seem, some of the competitors only fitted one wheel with their special non-skid device, so that it was once again demonstrated with great emphasis that such a proceeding is futile. One of the machines—that of Mr. H. W. Rawlins—was fitted with solid rubber tyres of such a section as to give the effect of twin tyres, but obviously on a bicycle, where only one side of the tyre touches the road when turning a corner, such an arrangement is useless. Altogether, so far as the prevention of side-slip is concerned—apart from questions of durability, comfort, and resilience—it was evident that nothing has so far proved more successful than metal studs, chains or straps, projecting from a comparative springy surface. We shall give the official results of these well conducted trials as soon as they are available.

International Cup—French Eliminating Trials.—The trial for the selection of the French team was held on the 11th inst. over the St. Arnould-Dourdan-Ablis Circuit, and resulted in the victory of Demester, on a Griffon motor bicycle shod with Michelin tyres, Giuppone and Champoiseau, each riding Peugeot machines shod with Dunlop tyres, arriving second and third respectively.

Fourteen of the competitors (a list of whom we published last week) started, and thirteen completed the first lap, only six finishing the full course of five laps. Demester, the winner, started second, and took the lead at the second lap; he lost this premier position, however, during the third and fourth rounds, but fortune favoured him in the last lap, and he was eventually at the head of the selected team. Giuppone and Champoiseau rode steadily throughout, although they changed their relative positions with one another more than once.

There is little doubt but that Cissac (Peugeot) would have been higher up than 3rd reserve but for a burst tyre which brought him to the ground during the latter part of the final round. Cissac started fourth, followed Demester in the second round, and took the

lead from that time onward until his accident. He was eventually able to finish the course and is one of the three reserves.

Last year's record for this course (167 miles) was made by Lamberjack in 3h. 30m. 14½s., but this has now been beaten by about 5m. The competitors were this year timed over the flying mile, and in this Demester was also first, his time being 56½s. (64 m.p.h.). His average speed over the whole course exceeded 44 m.p.h., which is a very creditable performance for this machine and especially the tyres. Lamberjack, who also rode a Griffon, was timed over the mile for 56½s. Tavenaux's time, the next best, was 57½s.

The following are the net times of those who completed the five rounds of the circuit. The first three will constitute the team in the final event, and the others will be held in reserve. All the bicycles were two-cylinder machines.

Driver.	Machine and Motor.	Net Time.			Bore and Stroke.	Weight.
		h.	m.	s.		
1 Demester ...	Griffon (Z.L.) ...	3	24	57	85 × 85	49'55
2 Giuppone ...	Peugeot (Peugeot)	3	27	52	80 × 86	49'3
3 Champoiseau ...	Peugeot (Peugeot)	3	29	31	80 × 86	49'7
4 Anzani ...	Alcyon (Buchet)	3	31	13	90 × 90	49'3
5 Bucquet ...	Griffon (Z.L.)	3	47	55	80 × 86	49'55
6 Cissac ...	Peugeot (Peugeot)	3	49	16	80 × 86	49'7

Now that the French Trials are over, it is possible to publish a complete list of the machines and drivers who will—all being well—take part in the event itself:—

England.—Ariel, Campbell; Matchless, Collier; J. A. P., Franklin.

France.—Griffon, Demester; Peugeot, Champoiseau; Peugeot, Giuppone.

Germany.—Three Progress machines, drivers not yet selected.

Austria.—Laurin-Klement, Ioman; Laurin-Klement, Wondrick; Puch, Nikodem.

THE Boat Express which left Charing Cross on Friday, at 9 a.m., had on board Messrs. J. S. Campbell, H. H. Collier, and C. B. Franklin, together with their attendants, and H. Rignold (reserve), the team selected by the Auto Cycle Club to represent England in the forthcoming International Cup Race, for auto cycles, at Dourdan, on the 25th inst. We wish them every success in their endeavour to uphold the reputation of England in such an important international contest.

1,000 Miles Trial.—At the meeting of the representatives of the motor cycle trade held last week at the Auto-Cycle Club, it was suggested that the 1,000 Miles Trial should be held from Tuesday, August 15th, to Saturday, the 19th, and Monday, the 21st, to Friday, the 25th, a distance of 100 miles per day to be covered, thus making up the 1,000 miles. The route to be the same as last year, only in the reverse direction, making, say, Oxford the destination the first day instead of the last.

London to Edinburgh.—The annual run from London to Edinburgh, which is held under the auspices of the Motor Cycle Club, took place on Friday and Saturday, the 9th and 10th inst. The event is essentially a test of reliability, all those reaching their destination within a time limit of 24 hours being entitled to a gold medal. The run commenced at 10 p.m. on Friday evening, and 55 competitors assembled at the G.P.O. for the start. Last year the starters numbered the respectable total of 44, but this year the event had evidently increased in popularity. On the other hand, only 20 finished within time limit this year as against 21 last year, so that the result can hardly be regarded on the whole as so successful.

The route lay through Potter's Bar, Biggleswade, Grantham, Toxford, Whetherby, Durham, Alnwick, Berwick, Dunbar, and the rules stipulated that Edinburgh must not be reached before 8 p.m. Saturday night. The Motor Cycle Club had made very careful arrangements for "checking" the riders, and the whole event was carried through without a hitch. No serious troubles were reported, and most of those who retired did so through misfortunes with their tyres. Mr. Penzer buckled the front wheel of his Ariel through driving into a ditch in order to avoid a cart, but although he lost nearly three hours on account of this mishap, he was nevertheless able to reach Edinburgh in time to qualify for a medal.

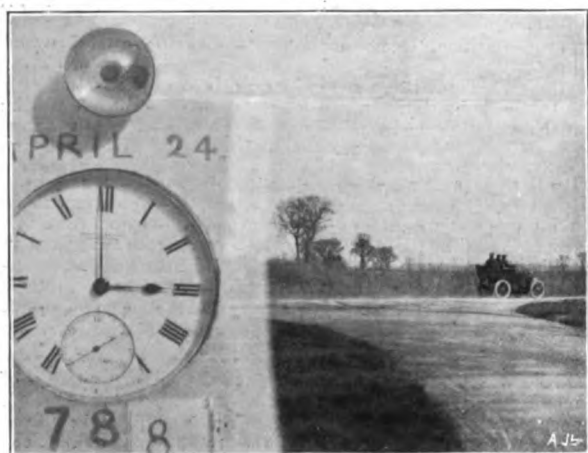
The ride during the night was wet and cold, but the morning dawned fine, and the roads improved as the riders advanced towards the North. The following qualified for awards:—Rev. B. H. Davies, 3-h.p. Triumph; A. Williams, 3-h.p. Quadrant; T. Woodman, 3½-h.p. Vindec Special; H. Williamson, 3½-h.p.

Rex; G. E. Roberts, 3-h.p. Triumph; A. Wilson, 3½-h.p. Ormonde; D. S. Baddeley, 2½-h.p. Baddeley; F. Hulbert, 2½-h.p. Triumph; R. M. Brice, 3½-h.p. Brown; L. A. Baddeley, 2½-h.p. Baddeley; A. H. Bindoff, 3½-h.p. Rex; W. H. Wells, 3½-h.p. Vindec Special; A. E. Lowe, 3-h.p. J.A.P.; H. E. Cowles, 2½-h.p. Rolfe-Goode; Wilbur Gunn, 10-h.p. Lagonda tri-car; W. A. Jacobs, 3½-h.p. Rex; T. Hooydonk, 3½-h.p. Ariel; J. W. Penzer, 3½-h.p. Ariel.

THE annual run of the Irish Motor Cycle Union of Ireland from Belfast to Dublin for the Canning Cup, presented by the Hon. Leopold Canning, D.L., was down for competition on Saturday last. The Belfast team secured it in 1903, the first year of its institution,

Dublin being the successful team last year. On this occasion, however, after the finish of the race, an objection was raised by the representatives of the northern branch in connection with the penalty enforced of deducting marks for arriving at the finish before the schedule time, as they maintained that the official distance of 98 miles specified on the official cards was incorrect, and that, therefore, the maximum and minimum times had not been exceeded. The Dublin centre, on the other hand, claimed to have fulfilled the conditions, as set out on the cards. Under these circumstances it was deemed advisable to declare the contest void, and to ride it over again, on a day to be named, before the end of this season. There were 23 starters on Saturday, of whom 10 made non stop runs, the stops of the remainder being mainly due to punctures.

A Time Recording Camera.—Primarily intended for the use of the police—to enable them to obtain accurate evidence when operating their “traps”—a new time-recording camera is now being introduced by Messrs. Gibbs and Dumbell. Our illustration is reproduced from a photograph taken by the first experimental camera of this kind that has been made, and it will be noticed that it not only affords a picture showing the car and its precise position at the moment, but that it also shows the exact time by the

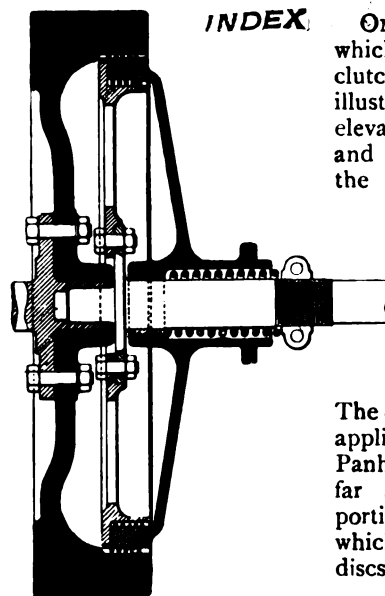


New time recording camera introduced by Messrs. Gibbs and Dumbell.

watch. In practice, a synchronised stop watch, with a registered number on the case, is intended to be used, and this is sealed within the camera in such a way that it cannot be tampered with. Above the watch is an opening for the date-card, and beneath it is a numbering apparatus that enables each negative to be identified, and the order of sequence to be established.

It is evident that the police force of Walton-on-Thames possesses in Sergeant Lucas an unappreciated genius and expert whose abilities ought certainly to have the effect of ultimately lifting him from the comparative obscurity in which his talents are now hidden. In a recent motor car prosecution, it was pointed out to him that it was impossible for anybody to press the spring of a stop-watch in the hundredth part of a second, to which the sergeant promptly replied that he could do it, provoking the very natural rejoinder from the defendant that in that case it was a wonder he was not taking £300 a year as an official timekeeper instead of vegetating in the police force.

The Panhard-Multiple Disc Clutch.



ONE of the forms in which the new Panhard clutches are now made is illustrated by the sectional elevation which we give, and which clearly shows the internal construction.

Another clutch of a similar general character—the Bradley—was described in full detail in our issues of March 11th and 18th last.

The explanation then given applies in the main to the Panhard clutch, except so far as it refers to that portion of the mechanism which separates the discs.

WE have often observed that in districts where police traps are organised on an extensive scale, there is ultimately an outbreak of anti-motorist hooliganism. It used to be Sergeant (now Inspector) Jarrett's favourite argument that if the police had not dealt with the motorists, the populace would have taken the law into their own hands. Facts seem to point rather the other way, and to show that the populace requires the police to set the example. At any rate, there is no district in England in which police traps have been more frequent than in the neighbourhood of Huntingdon, and now we find that regular traps of another kind for motorists and bicycles have been organised near that town. Several of the roads near Huntingdon have been strewn with hob-nails, boot-protectors, broken files, and other ironmongery to such an extent that the wheels of scarcely a single bicyclist or automobilist passing along them escapes puncture. The police appear to have been suggesting that this elaborate “mine-field” has been arranged by tramps who object to the dust created by motor cars. With all respect, we fail to believe this explanation. The amount of ironmongery involved would be worth something, as old iron, and tramps would be much more likely to “negotiate” the goods if in possession of them. No, the Huntingdon police had better look higher in the social scale, if they look at all, which we are disposed to doubt.



Five years ago, in the great 1,000-Miles Reliability Trial, Mr. Edward Kennard's 8-h.p. Napier, "Sir Charles," proved itself to be one of the best cars in that now historic event. Even to-day, when Mr. Kennard is obtaining his new 40-h.p. Napier—which is so much easier to drive although so very much more powerful and faster—the old car is still performing useful work, and is in continual use in Ireland.

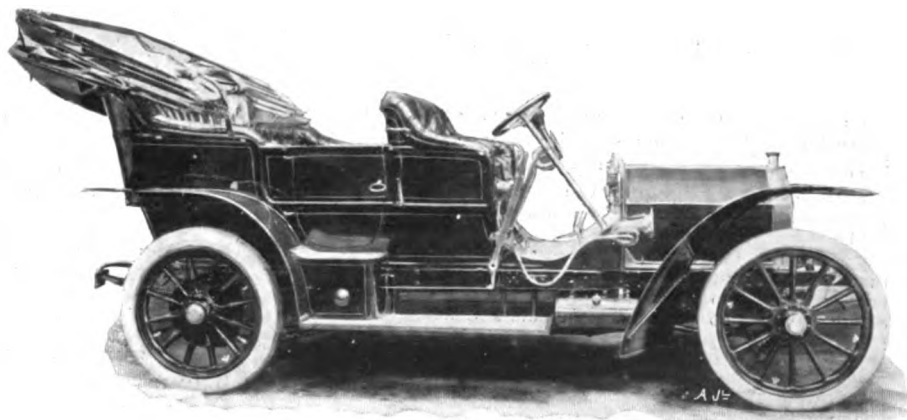
Agricultural Encouragement for the Automobile.

—Inspired by a praiseworthy desire to encourage the automobile movement, and also no doubt recognising the great services which certain classes of motor vehicle and internal combustion engines are capable of rendering to agricultural progress, the Royal Agricultural Society has reduced the fees paid for the exhibition of mechanically propelled vehicles at this year's Show from 20s. to 10s. per foot of space. The Exhibition, which takes place from June 27th to 30th, will be held as usual at the Society's grounds at Park Royal, which is particularly accessible by the Great Western line from Paddington, and the Show is one which ought in consequence to find favour with automobile manufacturers generally, and particularly those who have directed their energies to designing motors specially suited to the requirements of the farmer. We say "manufacturers generally," because the Agricultural Society's Shows are visited by a large number of residents in the country who would rarely, if ever, find their way to regular motor vehicle exhibitions. Ploughing, harrowing, and generally replacing horses about farms, are by no means the only services which the internal combustion engine is capable of rendering to the farmer. Portable internal combustion motors, which can be moved either by independent motor power or by horse traction are of the greatest value for chaff cutting, turnip cutting, winnowing, pumping, and a variety of other purposes about a farm, and these should undoubtedly find a place on a more extended scale in the future than they have in the past at the Society's Exhibition.

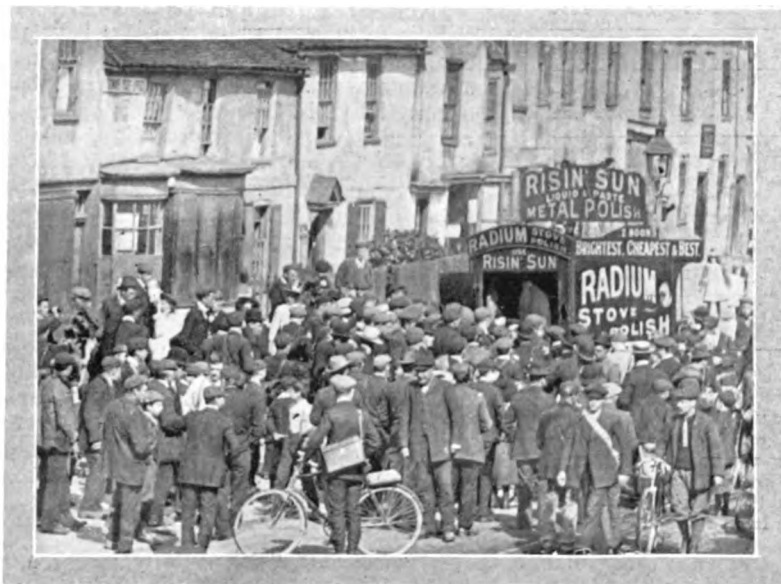
Accident to Mr. and Mrs. Cordingley.

—It is with great regret that we have to chronicle, among the Whitsuntide misadventures, the serious accident that occurred to Mr. Cordingley, his wife and her sister, when driving at Gap, in the South of France, on the Saturday before Whit Sunday. Mr. Cordingley's car was being piloted by Debrou, the driver who has been in his employment for a considerable time, when the cause which is so often productive of mishap, two wagons one behind the other, of which the further one unexpectedly pulls across the middle of the road, gave rise to the accident. In swerving to avoid the second wagon, which thus suddenly presented itself to view, Debrou ran the car into a tree and a smash occurred. All the occupants were thrown out. Mr. Cordingley had his arm dislocated, while Mrs. Cordingley received a very nasty gash on the head, which was so serious as at first to give rise to apprehension that her life was in danger. Miss Pursehouse fortunately escaped almost miraculously without a scratch and the driver himself only received a few slight bruises. We are glad to learn subsequently that the condition of neither Mr. nor Mrs. Cordingley is as serious as was at first feared, and that there is every prospect of their early convalescence.

As the result of another Whitsuntide accident we have to deplore the death of Mr. Joseph Crowther, J.P., a prominent manufacturer of Huddersfield, whose car got out of control when descending the steep hill on Pole Moor, near that town, on Sunday evening, and crashed into a wall. The car was completely smashed, Mr. Crowther being thrown out, and receiving injuries to which he subsequently succumbed.



Originally built as a wedding present for the German Crown Prince, the 40-45-h.p. Mercedes Car shown in the above illustration has just been acquired in this country by a well-known engineer from Messrs. J. E. Hutton. At the last moment, the Kaiser ordered two 28-32-h.p. chassis instead of this more powerful car, which, needless to say, is superbly finished in all respects. The side entrance body accommodates seven persons, and the Cape cart hood affords ample protection in bad weather.



During the memorable tramp to London of the Raunds boot makers, the men received a supply of food en route from a motor van. In our photograph this incident is seen, the van in question being on the right-hand side of the photograph, with the men clamouring for their meal. In regard to this particular Napier van, it has been now in use for about 3½ years for the conveyance of a well-known metal polish throughout England, the car calling at various railway stations from time to time to replenish the stock. During its work, it has covered a distance of about 75,000 miles, running daily with scarcely any delay whatever, only the smallest renewals, such as brasses, being necessary throughout the entire period. The car, which is known as "Charley's Aunt," "Evergreen," &c., has several times had the experience of being stopped by the police for exceeding the speed limit, upon occasion with seven up in addition to its load.

THE comic or semi-comic writers of the general Press are doubtless often hard up for something to make fun of. With existing circumstances there are advantages in making fun of the automobile movement, so we think that we may conclude that the following advertisement, which is declared to have appeared in the columns of the *Morning Post* has been inserted by one of these enterprising gentlemen, and doubtless somewhere or other in the multitudinous columns of the daily papers he has made capital out of his own advertisement. It is, at any rate, a humorous production. Perhaps, after all, it may be intended as a bit of caustic humour. The following is the advertisement to which we refer:—

MOTOR-CAR wanted, capable of going between John o' Gaunt's House and Land's End in six hours without stopping and able to hold a party of eight persons, in exchange for splendid recipe for marmalades. Chauffeur wanted for Christian family; must thoroughly understand his duties and do odd jobs in house if necessary, and also play the harmonium in church and train the choir; salary £20 per annum.—Address Chaux, 35, Waterloo Street, Hove.



AN ELECTRIC TAIL LAMP.—A very neat form of tail lamp has just been put on the market by J. Child Meredith, Limited, which has been specially constructed for its particular use. The lamp—which is quite watertight—is made with two glasses so that it shows a red light to the rear and also illuminates the number plate.

MANY months ago we announced the intention of the A.C. of America to hold practically simultaneously with the Association of Licensed Manufacturers in America, an automobile exhibition in New York. This is now officially confirmed, as also the hall where the exhibition will take place, viz., in the Armoury of the 69th Regiment on Lexington Avenue, New York. The Licensed Association's show, taking place from January 13th to 20th inclusive, is open only to manufacturers of petrol cars who are members of the Licensed Association, and to manufacturers of steam and electric cars, the latter classes not being affected by the alleged "master" patents controlled by the Association. The club show will be held during the same month, and possibly even the same week.

THE manner in which municipalities, when once they are allowed to trade, are disposed to interfere with the convenience of the general public is illustrated by the fact that a certain Mr. Pemberton has attempted to introduce an amendment to the North Eastern Railway Bill for the purpose of prohibiting the railway company from running local motor 'bus services. We are glad to say that this amendment was defeated by 127 votes to 110.

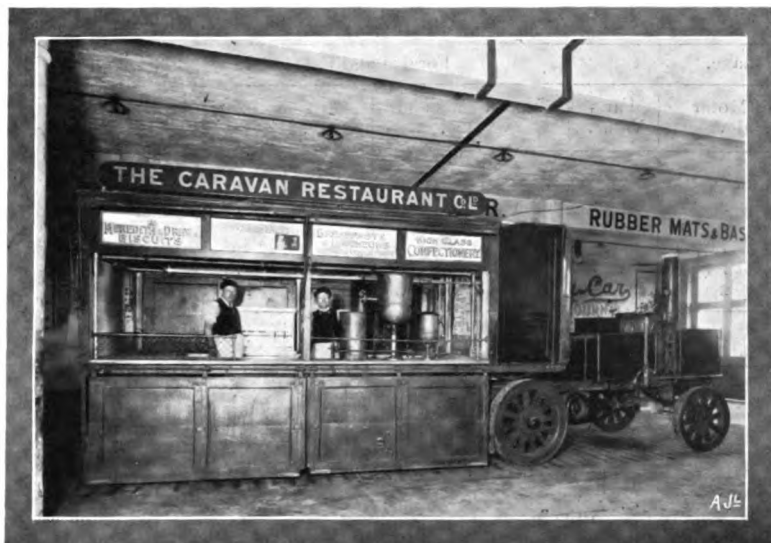
"C. B. FRY'S MAGAZINE," entertaining, instructive, and amusing as usual, has this month an article on "The Motor and the Cycle," by Mr. R. J. Mecredy, the versatile editor of the Irish *Motor News*. The article is largely taken up with description of an early tour in County Cork, and the troubles which befell the writer owing to his blind following of so-called expert advice. The result to a friend who accompanied Mr. Mecredy on the tour, and how he was chased round a circular hotel corridor three times (like Hector before Achilles round the walls of Troy) by an infuriated guest whose nuptial chamber he had inadvertently invaded, is in Mr. Mecredy's happiest style. Incidentally, by the way, Mr. Mecredy takes a hopeful view of the prospects of the motor bicycle industry.

THE Chertsey Rural District Council has decided to carry out some dust-laying experiments on the road between Byfleet Station and the Wey Canal. The central portion of the road is to be tarred, and the cost will be shared equally between the Council and Mr. F. C. Stoop—one of the leading local residents.

THE PRIESTROYD CONTACT-DISC.

THE peculiarity of this "commutator" contact-disc is that the whole rubbing surface is sheathed in brass, the actual contact segment, A, being insulated by a surrounding strip of ebonite. The advantage claimed for this construction is that the surface of the disc is not so liable to wear unevenly as is one in which all the rubbing surface—with the exception of the contact segment—is made of fibre or ebonite.





Many strange vehicles from time to time must necessarily pass under the hammer of the auctioneer specially devoted to dealing with second-hand cars. The above is an instance of this character, the scene being the auction rooms of Messrs. Friswell, Limited.

Speed in the Parks. Important decision.—In the King's Bench Division on the 8th inst., before the Lord Chief Justice, Mr. Justice Kennedy, and Mr. Justice Ridley, came the case of "Musgrove v. Kennison." This was an appeal from the decision of Mr. Marsham, the Metropolitan Police magistrate, sitting at Bow Street. The appellant had been, at the instance of the respondent, a police-constable, convicted and fined 40s. and costs for driving a motor car in the Green Park at a speed exceeding 10 miles an hour.

The case raised a question as to the power of the Commissioner of Works to make specific regulations as to the rate of motion of motor cars in Royal parks at a lower speed than the 20 miles provided for by the Motor Car Act of 1903. For the appellant it was contended on a variety of technical grounds that the rules or regulations laid down by the Commissioners of Works were *ultra vires*, as the particular rules made under the general regulations which had been published in the *Gazette* and laid on the tables of the Houses of Parliament had not themselves been so published and sanctioned.

On the other hand, it was said that all proper steps had been taken under the Parks Regulation Act of 1872 and other statutes to legalise the rules or regulations in reference to the Royal parks, including St. James's and the Green Park, and subsidiary rules as to the speed of traffic, and the general use of the parks by the public were left to the discretion of the Commissioners.

Mr. Ivory, K.C., and Mr. Moresby White appeared for the appellant, and the Solicitor-General, Mr. Bodkin, and Mr. Askwith for the respondent.

The Lord Chief Justice, without calling upon counsel for the Crown, gave judgment affirming the conviction. The subject of the regulation of the parks was, he said, a thorny one. The general regulations had, however, been laid before Parliament and otherwise legalised, and in his opinion the particular regulation objected to and others were left to the discretion of the Commissioners of Works, so that the public might have the fullest enjoyment of the parks subject to proper restrictions.

The other judges concurred, and the appeal was dismissed, the conviction being affirmed with costs.

Mr. E. H. LANCASTER, of 3, Leicester Street, Leicester Square, W.C., sole representative for Great Britain and Ireland for Clément cars, informs us that he is no way connected with the Lancaster Motor Association, Limited.

Mr. EUSTACE H. WATSON has taken over and is carrying on under his own name the automobile portion of the business of Messrs. Wallis and Watson, electrical engineers, of Trinity Street, Leeds.

PUBLICATIONS RECEIVED.

Throup's North Wales Cyclists' and Motorists' Guide. Bradford: T. Throup. 6d. net.

The Scottish Reliability Trial for Touring Cars. Official Report. Glasgow: Scottish Automobile Club.

Les Litiges de l'Automobile. By J. Imbrecq and L. Perisse. Paris: Vve. Ch. Dunod, 49, Quai des Grands-Augustines. Price, 6 fr. and 7 fr. 50 c.

Southwold. The Official Publication of the Corporation. By Ernest R. Cooper. London: The Health Resorts Association, 2, Grays Inn Road, W.C.

Deau. The Official Publication of the Corporation. Edited by George W. May. London: The Health Resorts Association.

Royal Leamington Spa. The Official Register of the Corporation. Edited by Geo. W. May. London: The Health Resorts Association.

Eastbourne. The Official Register of the Corporation. Edited by Geo. W. May. London: The Health Resorts Association.

Holiday Tours. London: Thos. Cook and Son, Ludgate Circus.

Catalogues.

Simms' Motor Vans. The Simms Manufacturing Company, Limited, Kimberley Road, Willesden Lane, N.W.

THE 1905 catalogue issued by the well-known firm of J. Lucas, Limited, is, as usual, excellently got up, and contains a very complete assortment of lamps, horns, and other fittings for which the firm are justly famous.



A beautifully designed advertising poster issued in Italy in connection with the Brescia Automobile Week, taking place from September 2nd to 12th.

British Exports and Imports of Motor Cars, &c., for 1905.

1905.	Exports, British and Irish make.					Foreign and Colonial Re-exportation.						
	No. of Cars and Value.		Parts Value.	No. of Motor Cycles and Value.		Parts Value.	No. of Cars and Value.		Parts Value.	No. of Cycles and Value.		Parts Value.
January ...	77	£ 25,590	£ 7,480	58	£ 2,026	£ 673	50	£ 19,006	£ 2,733	8	£ 214	£ 138
February ...	62	20,209	6,335	63	2,389	1,003	79	39,772	4,532	2	54	52
March ...	49	14,749	7,862	46	1,471	1,024	36	20,783	3,440	14	290	55
April ...	55	16,590	9,635	46	1,459	608	38	19,697	7,885	8	369	59
May ...	55	15,670	10,014	60	2,181	1,803	17	8,572	3,270	1	60	40
Total ...	298	92,808	41,326	273	9,526	5,111	220	107,830	21,860	33	987	344

NOTE.—For 1904 comparative figures see full table for the year in our issue for January 21st, page 91.

NEW COMPANIES REGISTERED.

Advance Motor Manufacturing Company (Limited). Louise Road, Northampton.—Capital, £10,000 in £1 shares (3,000 preference). Object, to acquire the business carried on by F. Smart, D. H. Gainsford, and J. C. Power, at 37, Louise Road, Northampton, as the Advance Motor Cycle and Engineering Company. First directors, F. Smart, D. H. Gainsford, J. C. Power.

Bettoruss Non-Skid Tyres (Limited).—Capital, £200 in £1 shares. Object, to carry on the business of manufacturers of non-skidding tyres, motor engineers, &c., and to adopt an agreement with L. E. Otto, W. W. Bennett, and R. Russell, in respect of the Bettoruss non-skid tyre band.

British Hele - Shaw Patent Clutch Company (Limited).—Capital, £12,000 in £1 shares. Object, to acquire the English business of the Hele-Shaw Patent Clutch Company, Limited, carried on at 34 and 36, Chatham Street, Liverpool. First directors, J. E. Jose, G. W. Needham, and H. P. Hall.

Imports.						
1905.	No. of Cars and Value.		Parts Value.	No. of Motor Cycles and Value.		Parts Value.
		£	£		£	£
January ...	362	149,578	36,608	57	1,842	905
February...	431	195,978	56,773	102	3,748	1,957
March ...	560	239,091	75,463	152	5,369	2,721
April ...	544	225,012	68,891	192	6,477	2,087
May ...	728	327,008	77,801	280	8,274	2,947
Total ...	2,625	1,136,667	315,536	783	25,710	10,617

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, Temple Bar, London.

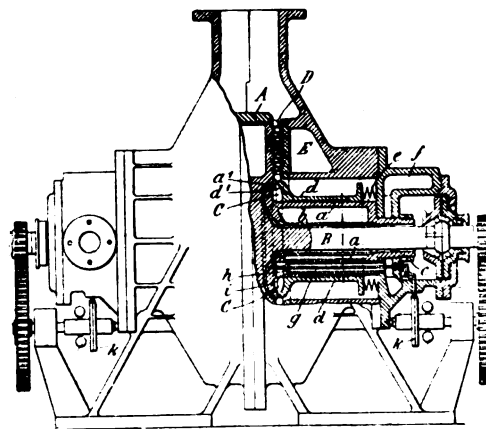
The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

14552. 28th June, 1904. Improvements in or relating to Internal Combustion Turbines. T. J. J. Wasley, 184, Saltwell Road, Gateshead-on-Tyne. This relates to a gas turbine driven by a succession of impulses by combustion products delivered from an annular outlet, the peculiar feature of the invention being that the combustion chamber is expandable and contractible, and that on expansion it develops an annular outlet. The explosive mixture is compressed into the combustion chamber, the

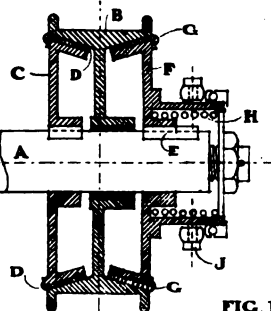
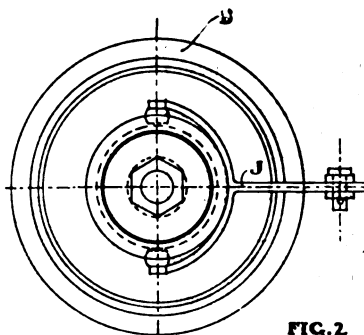
and held in position by the locking ring, c. The inner end of the sleeve, a, has a flange a'. On the sleeve, a, is arranged to slide the sleeve, d, the inner

end of which has the flange, d'. The outer edge of the flange, d', is held pressed against the outer edge of the flange, a', by the springs, e. The annular space left between the flanges, a' and d', forms the expandable and contractible annular combustion chamber, C. The explosive mixture is compressed and stored under pressure in a reservoir, from which it passes by the passage, f, in the turbine casing to the tubular passage, g, provided in the sleeve, a, controlled by the valve, h, and it enters the combustion chamber, C, through the port, i. The valve, h, is worked by the engine by the cam, k, so as to pass the charges at the proper intervals, and the charge is electrically fired within the combustion chamber, C. The force of the explosion separates the flanges, a' and d', and the gases pass through the annular outlet on to the turbine blades, D, of ordinary construction. The exhaust chamber is provided by an annular space surrounding the turbine wheel. E is the water jacket. May 25th, 1905.

18605. 9th June, 1904. A Double Friction Clutch for Motor Road Vehicles. B. G. Bateman, A. F. Pumfrey and J. Gibson, Furredown Parade, Thrale Road, Streatham. This invention relates to an improved form of double-friction clutch applicable to all forms of motor road vehicles, chiefly for those propelled by internal combustion engines. There are six figures, three filed with the provisional and three with the complete specification. Fig. 1 is a section. A is the driving shaft. B is the pulley or wheel transmitting the power. The wheel, B, is fitted loosely on the shaft, A, and may carry on its periphery sprocket teeth for a chain or the teeth of a gear wheel. C is a coned disc keyed to the shaft, A, provided with a copper face at D, turned to fit a similar metal face on the loose pulley, B. F is a second coned disc, rotating with the shaft, A, but sliding longitudinally on the feather, E. It is also provided with a copper face at G, engaging with a similar face on the other inner cone of B. H is a spiral spring which bears upon the side of the coned disc, F, and keeps the metal faces, D and G, engaged with the corresponding faces on the pulley, B. J is the forked end of a lever for sliding the pulley, F, along the feather, E, compressing the spring and releasing the frictional surfaces, which re-engage by the compression of the spring. May 25th, 1905.



chamber being held in its contracted and closed state, and on the firing of the charge the chamber is automatically expanded, and the explosion gases are directed upon the turbine blades from the annular outlet. There are six figures. Fig. 1 is a part sectional elevation of a radial flow gas turbine. The sleeve, a, has an internal water jacket, e, through which the shaft, B, of the turbine wheel, A, passes freely, the sleeve being secured to the turbine casing



1 INCHES

THE AUTOMOTOR JOURNAL

A RECORD AND REVIEW OF APPLIED AUTOMATIC LOCOMOTION.

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Photo by Michelin and Co.

AUVERGNE CIRCUIT. The turning at Laqueuille, seen from above. This is one of the vast number of bad points which have to be negotiated by the cars each Circuit.

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NOTICE.—Advertisement instructions should reach the office, 44, St. Martin's Lane, W.C., by first post, Wednesday. The latest time for receiving small alterations for Advertisements is 12 noon, Wednesday. No alterations can be made after that hour.

DIARY OF FORTHCOMING EVENTS.

British Events.

1905.	
June 24 ...	Catford Hill-Climb (Southern M.C.).
June 24 ...	100 Miles Passenger Trial (Motor Cycling Club).
June 24 ...	Motor Union Inter-Club Meet, Harrogate.
June 29 ...	Foster Cup for Non-Stop Run (Notts A.C.).
July 1 ...	Motor Gymkhana at Ranelagh (Ladies' A.C.).
July 1 ...	Padley Wood Hill Climb (Sheffield A.C.).
July 8... ..	Auto Cycle Club Consumption Trial.
July 8 ...	Notts A.C. Hill Climb.
July 12 ...	*Hill-Climb (Henry Edmunds Trophy).
July 19-22 ...	*Brighton Speed Races.
July 27-28-29	*Blackpool Motor Meeting.
July ...	24 Hours Run (Motor Cycling Club).
Aug. 2-3 ...	*Motor Boat Trials (Southampton).
Aug. 11 or 18	*Quarterly 100 Miles Trials.
Aug. 14-19 ...	Auto Cycle Club 1,000 Miles Reliability Trial.
Aug. 26 ...	Inter-Team Trial (Motor Cycling Club).
Sept. 2 ...	Skegness Races on Sands (Notts A.C.).
Sept. 9 ...	Brown Cup (Motor Cycling Club).
Sept. 12 ...	Auto Cycle Club Race Meeting.
Sept. 14 ...	*Tourist Trophy (Isle of Man).
Sept. 15 ...	*Daily Graphic Cup (Isle of Man).
Sept. 20, Oct. 24	*Van Trials.
Sept. 23 ...	Scottish A.C. Hill Climb.
Oct. 4 ...	*Speed Trials.
Oct. 7 ...	Scottish A.C. 100 Miles Run.
Oct. 14 ...	Scottish A.C. Anniversary Run (Ayr).
Nov. 10 or 17	*Quarterly 100 Miles Trials.
Nov. 17-25 ...	Society of Motor Manufacturers and Traders Exhibition at Olympia.

Foreign Events (Trials, Races, &c.).

1905.	
June 25 ...	International Motor Cycle Cup.
June 20-28 ...	Aix-les-Bains Week.
July 1 ...	Boulogne-Cape Gris-Nez (Motor Boats).
July 5 ...	Gordon-Bennett Race.
July 9-16 ...	Ostende Automobile Meeting.
July 11 ...	Start for Glidden Trophy (New York).
July 15 ...	Boulogne-Folkestone (Motor Boats).

* Automobile Club of Great Britain and Ireland Events and Papers.

July 16 ...	Mont Cenis Hill Climb.
July 20-26 ...	Paris to the Sea (<i>Journal de L'Automobile</i>).
July 28-Aug. 8	Paris Industrial Vehicles Trials (A.C. France).
July 27 ...	Gaston Menier Cup (Motor Boats).
July 31 ...	Anthony Drexel Cup (Motor Boats).
Aug. 6-7 ...	Circuit des Ardennes.
Aug. 10-11 ...	Paris-Deauville (Electric Vehicles).
Aug. 10-16 ...	Herkomer and Bleichroder Races.
Aug. 12 ...	International Cup for Motor Boats.
Sept. ...	Brescia Automobile Meeting.
Sept. ...	Tri-Car Competition (<i>L'Auto</i>).
Sept. ...	Vincenzo-Florio Cup.
Sept. 1 ...	Lake Geneva Motor Boat Meeting.
Sept. 2-3 ...	Ventoux Hill Climb.
Sept. ...	Tourist Car Trial (A. C. de France).
Sept. 3-10 ...	Royan Meeting.
Sept. 3-10 ...	Spa Automobile Club.
Sept. 11 ...	British International Cup (Motor Boats Arcachon).
Sept. 12-14 ...	Lake Lucerne Motor Boat Meeting.
Oct. ...	Vanderbilt Cup.
Oct. 1 ...	Chateau Thierry Hill Climb.
Oct. 15 ...	Gaillon Hill Climb.

"The Automotor Journal" can be obtained from all Messrs. W. H. Smith & Sons, and Messrs. Willing & Co.'s Bookstalls. All Railway Stations throughout France, and at

AIX- LA-CHAPELLE , J. A. Mayer, Eisenbrunnen.	PARIS OFFICE, F. Tennant Pain, 8 Rue Favart; Galignani's Library, 224 Rue de Rivoli; Librairie Titonot, 14 Rue Castiglione; Librairie Byron, 8 Rue Castiglione; Librairie Shakespeare, Avenue des Champs Elysees; Librairie Celtic, Rue Marbeuf; Librairie Anglaise, Avenue Victor Hugo; the Kiosques at the Nord, Lyons (P. L. M.), and St. Lazare Termini; and at the principal Kiosques on the Boulevards.
BADEN BADEN , Otto Ryssel, 42 Lange Strasse.	ROTTERDAM, Nederlandsche Kiosken Mijp, Wynhaven 85.
BERLIN, Ilges, Passage Unter den Linden, and Railway Bookstall.	
BERNE, Schmid & Francke.	
CARLSBAD, Hoffmann & Epstein, Alte Wiese.	

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PASSING EVENTS.

The French Eliminating Trials.

THE great race on the Auvergne Circuit for deciding who are to be the three champions to represent France in the Gordon-Bennett Race has proved in several respects almost more interesting than it was anticipated it would be. First and foremost, it has proved a splendid testimonial to the magnificent qualities of French racing drivers. Never before has a race been run on such a difficult and even dangerous course. Whole crowds of pessimists have for a long time been going about wagging their heads and saying that the first serious race held on the intricate, hilly and serpentine course through the Auvergne mountains would prove a holocaust which would throw Paris-Madrid completely into the shade. There is nothing pleasanter than to have to chronicle the fact that the head-waggers have been, as usual, grossly mistaken. The race has been held and without a single fatal or even serious mishap, and only one accident in which anyone was hurt, for the incident in which Henri Farman and his driver were both simultaneously pitched out of their car, into the top branch of a friendly tree, where they remained in comfortable security while the car rushed violently down a steep place into a vineyard where an elderly gentleman was pruning his vines, is of the nature of a comic interlude pure and simple. It shows both that there is a special deity that watches over the fortunes of racing automobilists, and also that Baron Munchausen was only an intelligent anticipator of events. But that the course was dangerous and difficult, as we have repeatedly pointed out, is sufficiently clearly shown by the relatively low speed at which Th  ry, the winner, on his Richard-Brasier car, accomplished it. His pace works out at a shade over 45 miles an hour, a considerably slower pace than he developed on the Ardennes eliminating course last year. It was, of course, to some extent due to a 25 minutes' stop for tyre repairs, which did not incommode him to the same extent in the previous events. But even taking this into account, the fact that a driver of Th  ry's experience, *verve*, and we were going to add nerve, but would prefer to say total absence of nerves, did not average a higher speed than this, is a most eloquent testimony to what the course really is.

The Gordon-Bennett Race this year, therefore, will be pre-eminently a test for drivers, though not altogether. The twists and turns will be a severe test also of the capabilities of the cars, and especially of the tyres. In this respect, the selection of the course certainly tends to put a premium less upon the racing monstrosity which has been so frequently decried, as upon a type of car that, in some respects, approximates more nearly (amongst racers) to the touring vehicle. The French designers have, of course, realised this. At any rate the designers of the successful cars have done so, and have departed from previous racing practice in very considerably shortening their wheel-base, while devoting their attention even more than before to lowering the centre of gravity as much as possible. That such modifications as these in racing design have had to be introduced, justifies, to a certain extent, the selection of this particular course. The world has learnt as much as it wants to learn about car racing on long stretches of comparatively straight road. The more the Gordon-Bennett or similar races handicap mere speed, and put a premium on manageability, the more likeli-

hood there will be of automobile racing continuing to keep its place as an institution, and continuing to furnish data of interest to car designers and engineers.

A Misunderstanding.

ULTIMATELY, advantages almost always accrue from free and unfettered discussion in the columns of the press. We need hardly ask for a better instance in point than the case afforded by the proposed bridge over the Arun at Littlehampton, and the comments which we made upon the project in our issue of the 3rd June. It will be remembered that in an editorial under the heading of "Attack by Discrimination" we drew attention to the fact that under the proposed measure it would be legal to charge as much as 6*d.* a hundredweight for any goods drawn across the bridge otherwise than "by any horse or other beast," and that this might of course mean prohibitive tariffs for goods carried on motor luries or delivery vans. A leading resident of Littlehampton, Mr. Neville P. Edwards, who—being Chairman of the Bridge Committee—is taking an active interest in the promotion of the Bill, and is himself an enthusiastic automobilist, read our article and was very angry (naturally enough) at what he supposed to be a gross misrepresentation of the situation. We wrote to him without delay, explaining that the phraseology in question was indeed part and parcel of the Act now before Parliament, a fact which, as the second of the two letters which we publish in our correspondence columns shows, he had not originally appreciated. Apparently, the objectionable clause was slipped in by some official, word for word as it stood in the old Act by which the ferry was empowered to collect tolls, dating from 1824. Mr. Edwards is a hearty friend of the automobile movement, and we learn with great satisfaction that neither he nor any of the inhabitants of Littlehampton interested in the promotion of the Bill had any intention whatever of unfairly discriminating against self-propelled traffic. On the contrary, they are looking to it to very largely render the bridge a paying concern. In this they are probably right, and the scheme should be supported by all automobilists, for the ferry over the Arun has hitherto formed a very serious gap in the lower or coast road which runs along near the Sussex shore from Worthing to Chichester, and for heavy goods transport the ferry has been impracticable. Mr. Edwards has accordingly arranged that the Parliamentary agent in charge of the Bill shall be instructed to revise this clause, and the possibilities, therefore, of imposing prohibitive tolls on motor drawn goods will be done away with.

And Its Results.

The situation itself, and the correspondence we have had with Mr. Edwards over the subject, show how easy it is for the intentions of the promoters of a Bill to be more or less thwarted, or at any rate made to look quite different from what they are, by a Parliamentary draughtsman with a special taste for musty and fusty precedents. The exposure of this is at any rate one gain that has resulted from the discussion. Another important result is that it has had the effect of eliminating the objectionable ancient clause. We now know that it would probably never have been enforced, even if it stood as at present. With the influence of Mr. Edwards, and the general feeling prevailing in Littlehampton, it certainly would not, for the tolls might be anything less than 6*d.* per cwt. which the

authorities like to arrange. But some day a reactionary Board might be in power, and then they might make use of it. We are glad this danger has now been avoided, and, needless to say, we experience a feeling of satisfaction that our article has assisted in producing this result. At the same time, we would not be too sure that Mr. Edwards is right in saying that the old clause imposing prohibitive tariff on "goods, wares, merchandise matters, or things, not being in any carriage drawn by any horse or other beast," was altogether levelled against hand barrows and carts, or that it dates from a time before motors were thought on. On the contrary, Greville's steam carriage was on the roads in 1822, though, of course, the steam car boom was not yet, but we are inclined to look upon it as one of the first examples of the policy which so successfully drove these marvels of ingenuity, the old steam cars, off our roads. However, we are heartily glad that it was only by accident, and not by intention, that, as we said in our former article, the Bill was "a sample of the bad old spirit of former days." The bridge will accordingly be, from every point of view, so unmitigated an advantage to the general public, and particularly the automobile public in the south of England, that we trust it will not experience, from now on, any serious opposition, and, with the objectionable clause modified, we think we may assure Mr. Edwards that there will be none, at any rate, from the automobile world.

We are pleased to be able to add that the local paper, the *Littlehampton Gazette*, reproduces our article in full, and recognises that this "timely warning" may have its desired effect. The *Gazette* was evidently as little aware as Mr. Edwards and the promoters of the Bill of the clause that had been foisted into it, and we are pleased to find the confirmation by the *Gazette* of Mr. Edwards' statement that the Town Council are not only far from anti-automobilists, but hope that the bridge will have the effect of deflecting a considerable amount of automobile traffic through the town.

"The Registered Number Again."

We now learn that the facts in regard to the prosecution of the London Road Car Company, to which we referred under the above heading last week, were not quite what at the time we understood them to be. It is only manufacturers who are entitled to claim a general registration number, but we were under the impression that the chassis on which the drivers were being taught was still the property of the manufacturers, and was being employed by them to teach drivers still in their employ. As a matter of fact, however, we find that the chassis in question was the property of the London Road Car Company, and that the purchasers were running it with the manufacturers' number plate. This, of course, puts a quite different complexion on the case. The manufacturers ought certainly, in supplying their chassis to the customer, to remove their plate before delivering the vehicle, and the Motor 'Bus Company, having no right whatever to use the number granted to the manufacturer, should have at once proceeded to register the chassis as an ordinary motor car with a black-and-white number-plate. The case, therefore, was not one in which the police can be said to have insisted on a literal interpretation of the clause to the disadvantage of the industry. The point, however, to which we have drawn attention above was (as reported) apparently never brought forward

by the police, and no doubt therefore they considered it to belong to the same category as the cases to which we have previously drawn attention.

The Daily Paper Peril.

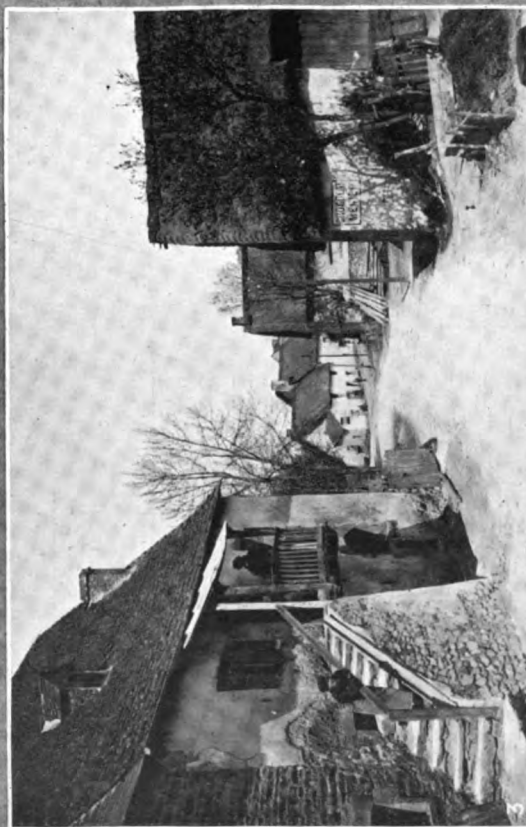
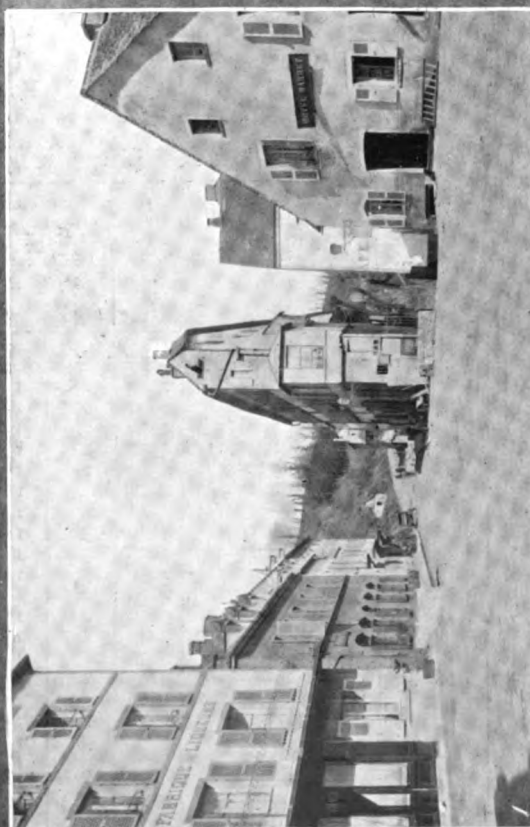
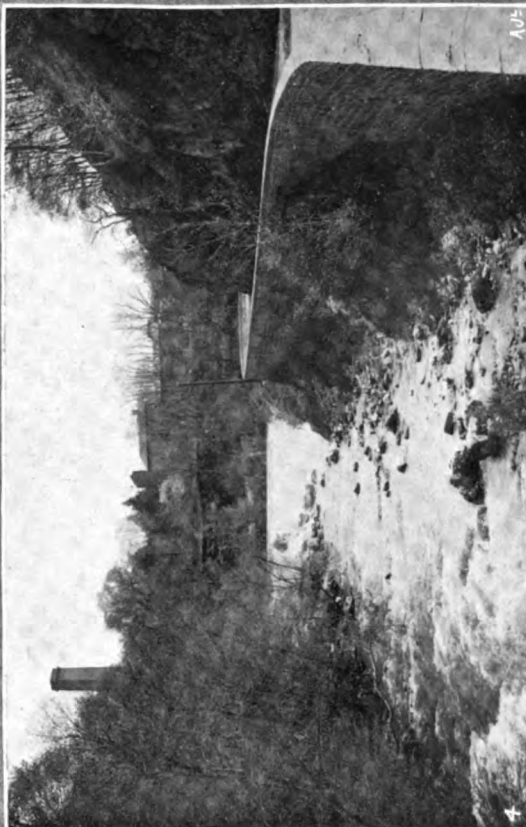
THE established practice of many daily papers, of grossly exaggerating, misrepresenting, and generally perverting the facts in any mishap in which a motor car is even remotely concerned, will hardly survive the glorious ridicule which has been poured upon it in the columns of *Punch* this week. Nothing kills like ridicule, and Mr. Punch has on many occasions given the *coup de grace* to mischievous absurdities. Our thanks and the thanks of all automobilists are due to him on the present occasion. We fancy we shall in future see a good deal less of these preposterous Press exaggerations.

The singular appropriateness of Mr. Punch's burlesque on the situation is illustrated by the letter from the Hon. Arthur Stanley, chairman of the Automobile Club, which we reproduce in another column. The cases of misrepresentation, exaggeration, and positive false statement, to which he refers in this letter, and to some of which he has already drawn the attention of the House of Commons, are so preposterous that the imaginary burlesques of Mr. Punch hardly read like exaggerations of them. It is a wise course for Mr. Stanley to draw attention to these scandalous examples of misrepresentation, and this is necessary, but in the long run it will probably be found that Mr. Punch's method of ridiculing the exaggerators by still further exaggerating their exaggerations, also has its merits.

Grandmotherly Caution.

WE are sorry to find that the Thames Conservancy is either in a panic or is giving way to popular prejudice. The Board has issued a regulation prohibiting petrol motor boats from going through locks at the same time with rowing boats or other craft. Anything more grandmotherly or absurd can scarcely be imagined. The conservators explain their regulation as designed to prevent other boats being burned should the motor boats take fire when locking with them! Considering the large number of petrol motor boats that have been in use for a number of years on the Thames, and the immunity from accident in the way of fire that they have enjoyed, it is nothing short of ludicrous to introduce such a regulation at the present date. One is anxious to know, too, whether the motor boats will be kept out of the locks while there are any rowing boats to go in, or whether the opposite course will be adopted. In either case we fancy a good deal of unpleasant confusion will result.

It appears that in the county of Durham, horses have not yet got thoroughly accustomed to automobiles, and pretty frequently display the indications of alarm (or is it trade jealousy?) out of which the equine race is now practically educated in the neighbourhood of London. The County of Durham Automobile Association is accordingly doing good work in arranging for its members to provide cars for horse-frightening purposes, that is to say, for gradually accustoming those horses of the neighbourhood whose owners desire it, to the appearance of motor vehicles. This is the right way to go to work, and will undoubtedly have the effect of tending to lessen agricultural and equine prejudice against the new locomotion in the county.



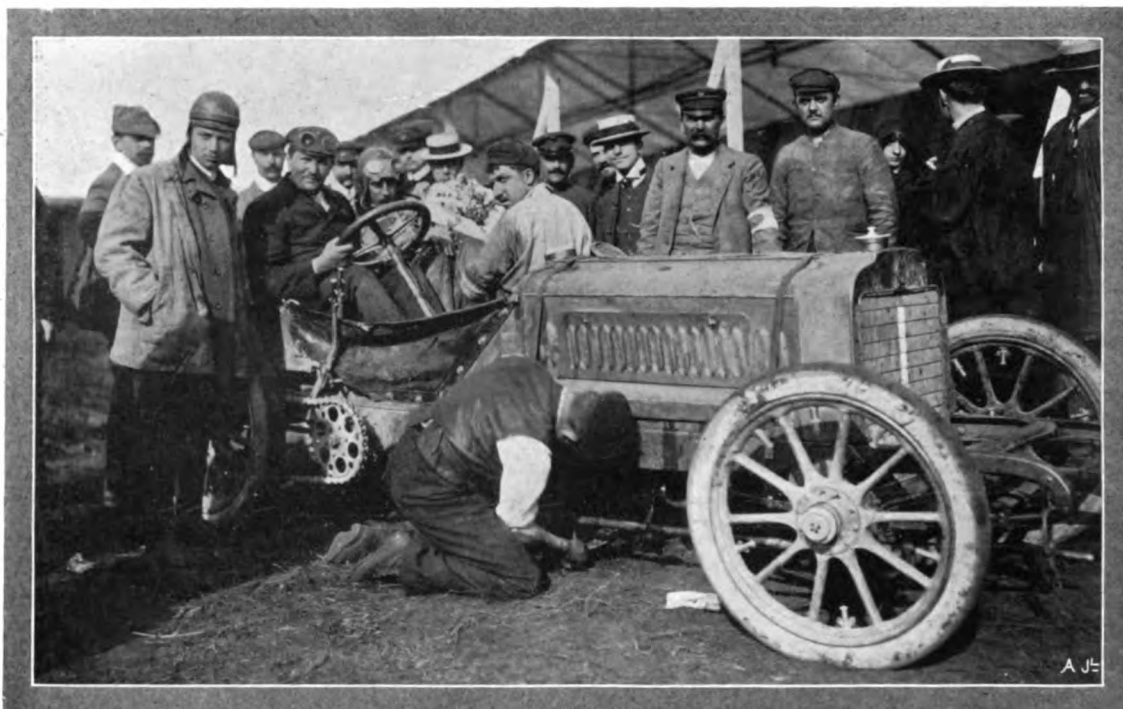
Photos by Michelin and Co.

Pontgibaud,
The River Sioule at Pontgibaud.

AUVERGNE CIRCUIT.

The exit at Rochefort, where the worst turning is.
The end of Lastic village.

FRENCH ELIMINATING TRIALS FOR THE GORDON-BENNETT RACE.



GORDON-BENNETT RACE. FRENCH ELIMINATING TRIALS.—Théry, the winner, on Richard-Brasier car No. 1, after the finish at Laschamp.

CLERMONT FERRAND is the capital of the Auvergne district. It is not a tremendously important town in itself, though it has always possessed a certain interest for automobilists, owing to the fact that the works of the great Michelin Tyre Company are situated there. And

it can also claim to have once made history to a very mild extent in the days of General Boulanger, for it was the reception that he received at this town that prompted him to aspire to the Dictatorship of France. But it has made history now, and is destined to make it

TABLE OF RESULTS OF THE FRENCH ELIMINATING TRIALS.

Place.	Car, Official Number, and Driver.	Gross Time per Lap (85.3 Miles).				Total Time for Circuit (341.2 Miles).	Control Time.	Net Time.	Mean Speed.	Acceleration Times.	
		1st Lap.	2nd Lap.	3rd Lap.	4th Lap.					For the First 400 Metres.	To the Col de Moreno Turning.
		h. m. s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	m. s.	h. m. s.	m.p.h.	s.	m. s.
1	Richard-Brasier (1), Théry	1 49 52	1 36 25	2 9 47	2 6 45½	7 42 49½	8 0	7 34 49½	45.0	26	1 6
2	Richard-Brasier (11), Caillois	1 53 33	1 54 47	2 0 0	2 5 51	7 54 11	11 0	7 43 11	44.2	26½	1 11
3	De Dietrich (27), Duray	1 51 51	1 48 46	2 0 23	2 10 47½	7 51 47½	7 0	7 44 47½	44.0	26½	1 9
4	Darracq (18), Wagner	1 44 40	1 54 27	2 8 39	2 12 25½	8 0 11½	13 0	7 47 11½	43.7	23	1 0
5	Renault (2), Sisiz	1 48 47	2 12 7	2 1 9	2 40 57½	8 43 0½	47 12½	7 55 47½	43.0	27½	1 6
6	Panhard-Levassor (9), Heath	1 59 37	1 58 45	1 53 52	2 38 24½	8 30 38½	19 0	8 11 38½	41.6	23	1 4
7	Hotchkiss (5), Le Blon	2 2 19	2 7 4	2 1 21	2 20 29½	8 31 13½	17 59½	8 13 13½	41.4	25	1 6
8	Gobron (10), Rigolly	2 2 0	2 39 54	1 56 40	1 54 23½	8 32 57½	16 0	8 16 57½	41.0	31	1 14
9	Darracq (8), Hemery	1 51 14	1 52 28	2 12 12	2 28 44	8 24 38	3 0	8 21 38	40.8	52*	1 5
10	Clément (14), Hanriot	2 10 0	1 54 18	2 30 53	1 56 28½	8 31 39½	8 0	8 23 39½	40.6	30	1 17
11	Darracq (28), De La Touloubre	1 59 11	2 9 15	2 1 46	2 37 42	8 47 54	17 0	8 30 54	40.2	26½	—
12	Richard-Brasier (21), Stead	1 55 53	2 18 28	2 25 52	2 29 55	9 10 8	14 0	8 56 8	38.2	26½	1 12
13	Renault (12), Edmond	2 50 20	2 4 0	—	—	—	—	8 57 24½	38.1	25½	1 6
14	De Dietrich (7), Gabriel	1 58 0	3 15 18	2 5 12	1 56 59½	9 15 29½	15 0	9 0 29½	37.9	23½	1 8
15	Hotchkiss (25), Lavergne	2 26 0	2 30 10	2 9 10	2 48 20	9 53 40	2 0	9 51 40	37.5	24	1 6
	C.G.V. (3), Girardot	2 19 35	1 51 48	—	—	—	—	—	—	30	—
	Bayard-Clément (4), A. Clément	2 7 31	—	—	—	—	—	—	—	23½	1 4
	Automoto (6), Lapertot	2 50 45	2 10 2	2 1 31	—	—	—	—	—	34	1 48
	Hotchkiss (15), A. Fournier	2 6 45	3 29 5	2 23 42	—	—	—	—	—	24½	1 5
	De Dietrich (17), Rougier	1 54 18	2 6 32	—	—	—	—	—	—	—	—
	Panhard-Levassor (19), Teste	2 44 0	2 7 35	2 5 45	—	—	—	—	—	25½	1 9
	Renault (22), Bernin	1 57 54	—	—	—	—	—	—	—	24½	1 7
	Bayard-Clément (24), Villemain	2 50 49	2 17 10	2 28 32	—	—	—	—	—	22	1 6
	Panhard-Levassor (29), H. Farman	1 56 43	—	—	—	—	—	—	—	23	—

* Bad start.



GORDON-BENNETT RACE. FRENCH ELIMINATING TRIALS.—Caillots, who secured second place in the team, at full speed on his Richard-Brasier car, passing the grand stand near the starting point.

again before the end of next month in a still more marked manner. Naturally it was the headquarters of everybody who desired to be present at the French Eliminating Trials, and it will also be the headquarters of most of those who attend the Gordon-Bennett Race on July 5th. The town itself had been packed to the utmost, and its hotel accommodation was considerably strained, for if there is one thing that Frenchmen are enthusiastic over, it is in the interest all classes feel in a great automobile race. All the world and his wife were represented. Motor cars of all kinds, shapes, and sizes predominated, but there were plenty of other vehicles too, the majority wending their way to Laschamp, where the start took place, though a considerable minority selected other points of vantage on the Circuit. The sun rose bright and clear—a

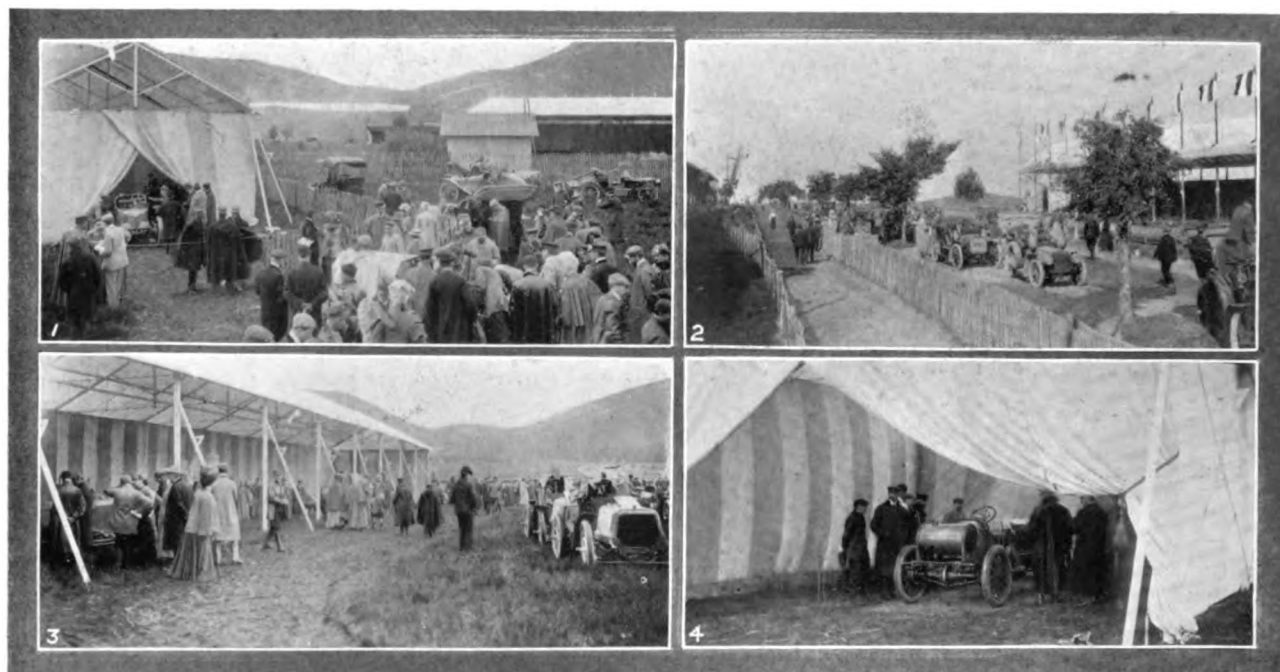
veritable "sun of Austerlitz"—and it was destined to shine upon a French triumph, not against other competitors, for the event was a national one only, but against the very considerable difficulties presented by a zigzag course in a mountainous district, where the gradients are notoriously sharp, and the corners, twists, and doubles are particularly dangerous and perplexing.

To swell the crowd, the special train organised by *L'Auto* arrived a little before six at Clermont, and turned out its throngs of automobilist journalists and general enthusiasts to betake themselves (under a certain handicap as regards time) to the various points they had selected.

No more picturesque or radiantly beautiful landscape than the scene of the start could be imagined. The sun had already risen upon the mountains, and the



GORDON-BENNETT RACE. FRENCH ELIMINATING TRIALS.—Duray, on his De Dietrich car, with which he secured the third place, passing the Tribune at Laschamp.



Photographs by Michelin and Cie.

General view of the enclosures and the weighing-in tent. Seen through the opening on the left, Rigolly's Gobron-Brillié Car is on the scales.
The garage for the racing cars in the Trials.

General view of the starting point and the grand stand.

The interior of the weighing-in tent. Fournier with his Hotchkiss Car is being "scaled."

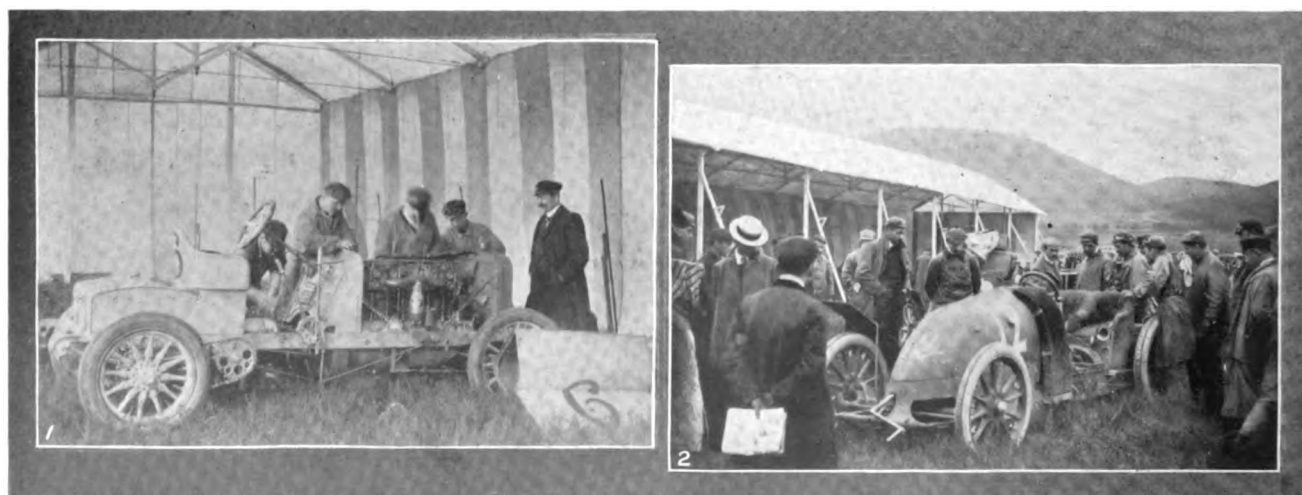
GORDON-BENNETT RACE—FRENCH ELIMINATING TRIALS.

toothed chain of the Auvergne Dômes—those extinct volcanoes—gradually shook off the haze of morning till it formed an imposing contrast with the deep verdure of the valleys by which it is intersected. With that excellent taste characteristic of the nation, the temporary erections of the Automobile Club de France and the Auvergne Club rather improved than detracted from the picturesqueness of the landscape—results which are not always attained in other countries.

Round the starting point were assembled the usual phalanx of official personages. Mons. Etienne, Minister

of the Interior, was represented by the permanent chief of the department. M. Boucomont, Prefect of the Puy de Dôme district, was also present, and a large number of the officials of the Automobile Club de France, the Baron de Zuylen doing the honours with his customary courtesy and bonhomie.

The hour for the start drew near, and in the neighbourhood of M. Tampier, the official starter, there was quite a little court of manufacturers and veteran drivers, amongst whom was, as usual, particularly noticeable, the hero of a hundred races, M. René de Knyff.



Photographs by Michelin and Cie.

Lapertot and his Automoto vehicle, No. 6, under examination for parts.

Edmond with his Renault Car, No. 12, undergoing examination.

GORDON-BENNETT RACE—FRENCH ELIMINATING TRIALS.

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CHAS. J. GLIDDEN.

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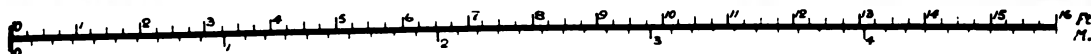
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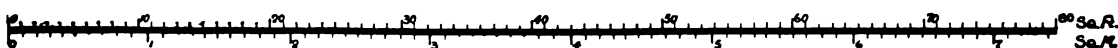
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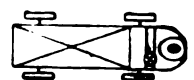
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At a few minutes to six, Théry, on his Richard-Brasier, drew up to the starting point, his broad, good-natured, capable, self-possessed features smiling his familiar smile before he closed his vizor, or, in more modern phrase, adjusted his mask and goggles. He is tremendously popular, and he was received with the highest compliment a crowd ever pays to anyone—complete silence. Only when he had shot from the starting point, with splendid attack and magnificent acceleration, rose a tremendous cheer, which followed him till he disappeared from view some 2 kiloms. along the course. By order of the Government, 4 minutes had to be allowed between starting each car; this interval therefore elapsed before Sisz, on the Renault car, was despatched. After him all

acclamation, and his nickname was freely heard—"Chronometer Théry"—which the splendid regularity of his running in the Gordon-Bennett of last year had earned for him. Théry's time for the first round was 1h. 49m. 52s., though the actual running time could not, of course, at the moment, be computed, having regard to the Government's enforcement of "time intervals."

Ten minutes after Théry, came Sisz, and he was followed by Wagner, on a Darracq, who appeared to be gaining on the champion of last year, though the gain, as subsequently transpired, was not maintained, and admirably as Wagner drove, and excellently as his Darracq behaved itself, he just failed to secure a place in the French team.



GORDON-BENNETT RACE. FRENCH ELIMINATING TRIALS.—At Laschamp. Théry, the winner, "lapping" De la Touloubre's Darracq on the third round. This was the only car under the time-controlling arrangements which Théry lapped during the whole race.

followed in their official order without incident, till Wagner's turn arrived. His start made quite a sensation, and had the appearance of being more rapid than those of the other competitors; in fact the story goes that the camera brigade, waiting to snap each of the starters, failed to snap him, for he had passed before the operators could snap, and so the cameras snapped nothing but the empty road. At least this is the statement they retailed when they subsequently came to develop their plates. There were practically no incidents connected with the start; the whole 24 competitors were despatched with the regularity of clockwork at intervals of 4 minutes, and Henri Farman, driving the Panhard-Levassor car, brought up the tail of the hunt at 32 minutes past 7.

Scarcely had ten minutes elapsed after Farman had disappeared in the distance, before Théry was observed approaching the starting point at the end of his first round, being announced by a trumpet, as were each of the competitors in succession. He was hailed with

As far as could be judged from the times reckoned during the race, Théry led throughout, and this subsequently turned out to be the case. The other leading places changed but slightly during the rounds, the main differences being that Wagner and Sisz went up and down a little.

Ten competitors actually finished the fourth round in time to be classed, and 15 altogether out of the 29 "came in." The official decision on the trial resulted in the selection of

1. Théry, on a Richard-Brasier car, time 7h. 34m. 49½s.;

2. Cailliois, also on a Richard-Brasier, time 7h. 43m. 11s.; and

3. Duray, on a De Dietrich, time 7h. 44m. 47s.; to represent France in the Gordon-Bennett Race. Their detailed times, and those of the other competitors, are given in the table which we append.

This is a good straightforward result, and the names



Photo by Michelin and Co.

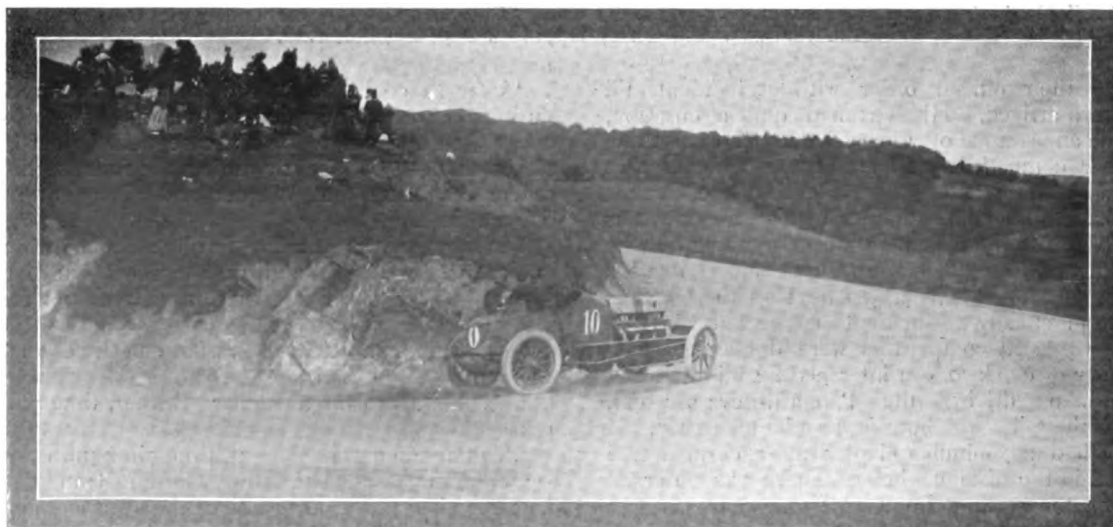
AUVERGNE CIRCUIT.—Three special bridges have been built on the Circuit, viz., at Volvic, Laqueuille, and Vauriat, spanning the Railways, in order to avoid having to stop the cars. The above picture shows the bridge at Laqueuille with Le Blon passing over it at full speed on a Hotchkiss Racer.

of the winners have been announced in order of merit as established by their times, a method one would like to have seen adopted by all the competing countries. The race has been a tremendous triumph for the Richard-Brasier firm. With all France against them, their splendid machines and splendid drivers have secured them the honour and the advantage of representing France in the Gordon-Bennett race by two out of the three cars allowed to compete. That one of the places in the team has fallen to the De Dietrich Company will give satisfaction to the wide circle of friends which the excellence of the cars turned out by this firm has won for them both at home and abroad.

As stated when dealing with the race editorially, there have been but few mishaps, only two in fact of the nature of a smash, and in only one of these were the occupants of the car injured. On the third round, Girardot when coming down the Sayat Hill and travelling well, had his two front tyres burst sud-

denly and apparently quite simultaneously. The car instantly became unmanageable and dashed into a ditch, both M. Girardot and his mechanic being shot out. It was at first rumoured that M. Girardot had been killed, but this report proved, as Mark Twain said of the news of his own demise, to be "grossly exaggerated." M. Girardot, we are thankful to say, was not killed, but he suffered very severe injuries, from which, however, he is recovering. His mechanic, as is said of passengers in railway accidents, "escaped with a shaking."

The accident to Henri Farman was purely of a comic nature, though it might have had far different results but for the opportune presence of a friendly tree, whose benevolent arms, like those of a Homeric goddess, snatched both Farman and his mechanic from danger at the critical moment. He was taking the turning at Mas d'Argnat on the first round, near the same point as that at which the accident happened to M. Girardot (that is to say



GORDON-BENNETT RACE. FRENCH ELIMINATING TRIALS.—Rigolly, on his Gobron-Brillié, at the Grand Tournant.

down the zigzag road of which we have several times pointed out the dangers). His car skidded round the corner, and before he knew what had happened he seemed to be lifted bodily into the air, and subsequently he and his mechanic found themselves reclining on the branches of a spacious tree beside the road. But the car had disappeared. It was subsequently learned that an elderly vine-grower, whose vineyard was situated at the bottom of the ravine, had been surprised, not to say terrified, by its sudden appearance upon the scene of his labours.

There were also a couple of subsidiary mishaps. Among other tyre delays experienced by Théry was one of twenty-five minutes in the third round. On the second round, too, Edmond had trouble with his motor owing to heating, and Albert Clement suffered from a cracked cylinder.

The race gradually eliminated a number of the competitors, the nine who failed to be placed being mainly disabled by tyre and ignition troubles,

none of which amounted in any particular cases to the dimensions of a catastrophe, but which were effectual in ultimately putting the cars which experienced them out of the running.

The prize of 100,000 francs, which has been offered by *L'Auto*, for the winner of the French Eliminating Trials, accordingly goes to the Richard-Brasier firm.

The journal, in drawing attention to this fact, couples it with the

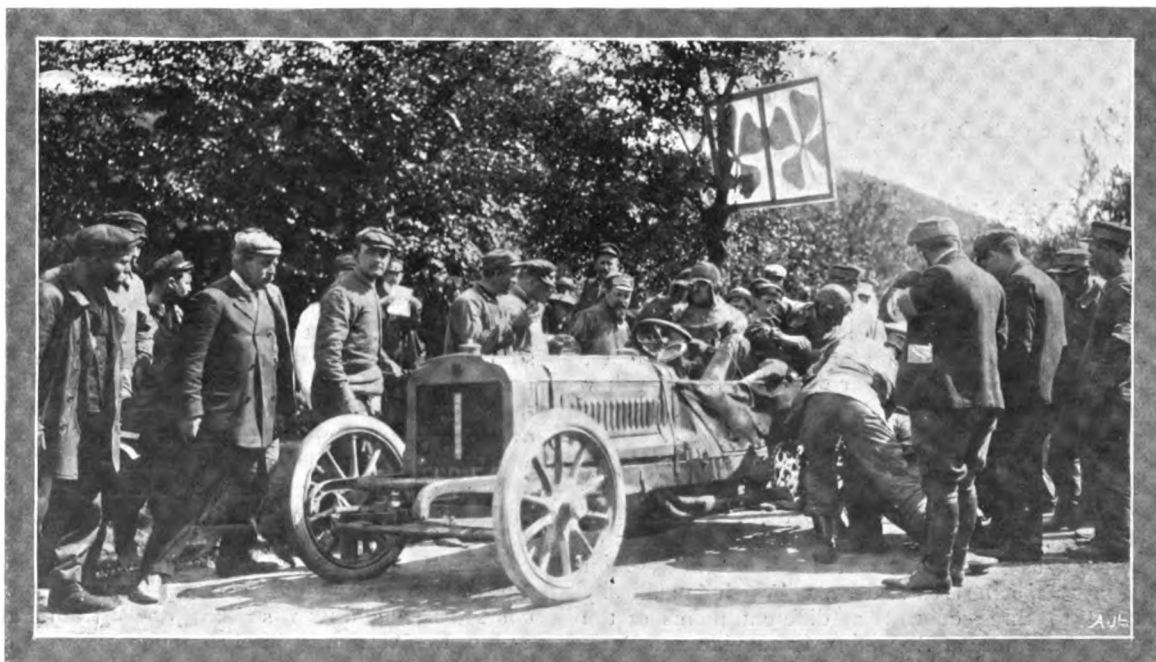
hope that some proportion of the amount will find its way into the pockets of the driver Théry, a suggestion which we have no doubt the firm may follow; in fact, his share is stated to be 40,000 francs.

Dust was a great trouble to everybody towards the end of the race. This was not the fault of the A.C. de France, who allotted a big sum for treating the course with a special preparation, but the contractors responsible for laying it, though charging elaborately for it, seem to have been very economical of that substance, at any



Photo by Michelin and Cie.

GORDON-BENNETT RACE. FRENCH ELIMINATING TRIALS.—
The much-photographed Théry is amused.



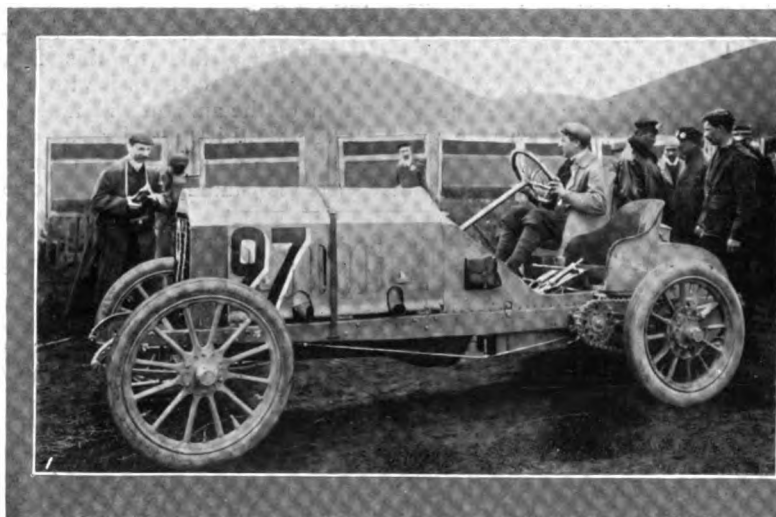
GORDON-BENNETT RACE. FRENCH ELIMINATING TRIALS.—Replacing a tyre on Théry's car at Col de la Mereno.

rate in places, where its dust-laying powers became quite exhausted before the end of the day.

To make things as pleasant as possible for the spectators, the club had arranged for the tarring of portions of the course in the neighbourhood of the grand stand, and tar was poured on this part of the course, not long before the race, in large quantities. The result was that the tyres of several cars which ran over that stretch on the day previous were absolutely ruined, though fortunately it had hardened sufficiently, when the actual race was run, to be harmless.

The telephone and wireless telegraph installations, on the latter of which (particularly) a large sum of money had been expended, were quite farcical in their performances. That the telephone service failed was not the fault of the telephones. The wires had been arranged so as to be accessible to the public, and the canny Auvergnats, who are greatly addicted to snaring rabbits, are said to have cut off lengths of wire during the night and converted them to their own uses. This naturally had a deleterious effect on the efficiency of the service, with the result that practi-

special coloured card which had to be inserted into a special box or case provided for it on the car. At Rochefort, each car was permitted to re-start immediately after receiving its ticket. At the two controls of Laqueuille and Pontgibaud, arrangements were made for introducing a certain interval between the competitors. Each time that a car arrived at the stopping point, it was separated from the preceding car by an interval of 3 to 4 mins. That, of course, means that if the preceding car had only just left the stopping point when the second car entered it, the second car would not be allowed to start till 3 to 4 minutes had elapsed, while if two cars arrived, one shortly behind the other and both close behind another car, the same intervals would be enforced between them all. If a number of cars arrived at the stopping point together, they had to form file on the right-hand side of the road one behind the other. If two cars had arrived at exactly the same moment, the faster would have been dispatched first, but as this event did not occur, the regulation in this respect was not actually needed. All repairs, refilling with water, fuel, lubricating oil, and replacing of pneumatics, was



Duray on his De Dietrich Car in the Laschamp enclosure.



Photographs by Michelin and Cie.
Caillots on his Richard-Brasier Car in Clermont Ferrand.

GORDON-BENNETT RACE.—FRENCH ELIMINATING TRIALS.

cally no information from the different controls was available during the race. The wireless telegraph man was also little better, for all that could be got out of him for a long time, when asked for information from different points of the course, was "Ça va bien." But as this appeared to be the only message he could retail, the officials of the A.C. de France pointed out that they had not paid a large sum for this information, after which a few definite data began to click through.

The French Government must to a large extent be thanked for the practical absence of accident on the difficult and dangerous course. When giving permission for the Eliminating Trials to be held, the Department of the Interior, as we reported at the time, insisted on arrangements being carried out which practically amounted to three controls at different points of the course. These were at Rochefort, Laqueuille, and Pontgibaud. At each of these points was a compulsory stopping place, lines being drawn across the road 8 metres apart, and each of the cars had to come to an absolute stop between these lines, where they received a

prohibited at these stopping points, and any kind of repair or adjusting operations likewise. The only act permitted was the re-starting of the motor. None of the competing firms were permitted to establish "service stations" within a kilometre of the stopping points, and when any car was stopped for these purposes, it had to be drawn up to the right-hand side of the road. All the bridges which have been constructed over the railway crossings, viz., at Laqueuille, Vauriat, and Volvic were considered dangerous points, and speed had to be reduced over them to 50 kilometres an hour.

Both Mr. Charles Jarrott and Mr. Letts, like many other leading automobilists in this country, were on the course, having driven straight down from Paris in a 24-h.p. De Dietrich. Wisely enough, they selected the delightful little watering-place of Royat, surrounded as it is, in the hollow of the hills, by the picturesque summits of the Auvergne "Dômes," as their headquarters during the event. Mr. Jarrott was enthusiastic about the race.

Never in all his experience (and that, we need hardly say, is a pretty extensive one) had he witnessed so hotly contested a race, or one in which it was more impossible, from the previous performances of the competitors, to form an idea who would be the winners. All the competitors are, in his opinion, splendid drivers of splendid cars, and the three winners just the three best of a contingent, nearly all of whom are a credit to their country. Mr. Jarrott, who as we all know laughs at dangers himself, thinks the course not really so very much worse than the Taunus course of last year. That even the winning competitors had a certain amount of trouble with tyres and also had other stoppages, makes him distinctly hopeful that some, at any rate, of the English competitors will make a good showing. If they can keep going, and going all the time, as, at any rate, two of them did in the Isle of Man, even though, perhaps, not quite so speedy nor quite so capable of rapid acceleration after stops as their French rivals, the result is likely to be creditable. Racing seems to have settled down to the selection of courses that test the drivers to the uttermost, and his advice to the British builder, who intends to compete in such events in future, is to increase his car power, because what really wins a race of this kind is the power of rapid acceleration after a stop or after slowing down to take a corner. In this respect, Mr. Jarrott considers the French cars and drivers quite superb, particularly Théry on his Richard-Brasier, but, as an actual miracle of starting and acceleration, the performances of Wagner impressed him more than anything he has yet seen, his starting and acceleration being, as we have pointed out above, quite phenomenal.

The attention of the automobile world is naturally centred on the three French representatives. Théry, we all know already. He has become an institution, and it is therefore superfluous to indulge in any further description of his round, massive, good-humoured face and stalwart proportions, or to again recall to English readers the impression of complete calm, in the midst of strife, which he diffuses around him. Needless to say,

Théry received an enthusiastic ovation on his return to Paris. A tremendous concourse of people, headed by M. and Madame Brasier, went out to meet him on the Choisy Road. Some of the local shopkeepers had even decorated their houses, and such was the wild enthusiasm that M. Brasier "paternally embraced" a number of charming young girls who formed part of the demonstrative throng. A large proportion of the enthusiastic crowd consisted of workmen, who recognised in the triumph of Théry the victory of a comrade and friend.

Caillois is the new star in the firmament of first-class racing drivers. He belongs to the same general type as Théry. He has the same good-humoured massiveness of face and figure, the same imperturbability, the same calm in trying circumstances. His is a typical French face of the more phlegmatic kind—the face of the type of Frenchman that is associated with the many triumphs of that country, in various fields of enterprise and activity. Curiously enough, his appearance is distinctly reminiscent of portraits of Béranger. Like many first-class automobile drivers, he found his way into the new industry through the bicycle profession. He was a capable road rider for many years. Then he took to the motor bicycle, and ultimately became a car driver. The present is the first time he has emerged into real prominence in the latter capacity, but he gave a very good account of himself in the Paris-Madrid Race, and he came close to being selected to drive for France in the Eliminating Trials last year.

The third driver, Duray, who successfully piloted the De Dietrich car, has gained his driving knowledge from Baron de Crawhez. His first *début* in a great race was in Paris-Vienna, where he suffered misfortune. Subsequently he ran a match with Rigolly, and last year he distinguished himself in the Circuit des Ardennes, and was in the Ventoux Hill-climb, where he took second place, being only beaten by Rougier. Duray belongs to a different type to either of the other two members of the team, having less of the square-faced strong-jawed characteristics of the former, and suggesting more the reflective, idealistic Frenchman, but this is counterbalanced to a large extent by his splendid physique.



Photo by Michelin and Cie.

GORDON-BENNETT RACE. FRENCH ELIMINATING TRIALS.—Before the Laschamp Grand Stand. The special archway and bridge for the public over the racecourse, erected by Messrs. Michelin and Co.

THE 1905 SIMMS-WELBECK CARS.—PART III.

THE rear wheels are mounted on tubular extensions, H, of the axle-casing, as shown in Fig. 8, and are driven by the live axle, K, through the two jaw members, K¹ and L¹. The member, K¹, fits on to the squared end of the axle, and the corresponding half, L¹, of the coupling is formed on the hub plate, L, of the wheel. Compensated internal expanding brakes, M, are fitted to the hubs of the rear wheels, and they

impossible to introduce the "reverse" until the sprag has been raised from the ground. This is a refinement which we have constantly urged manufacturers to adopt, for it entails but little expense, and is a protection which all motorists would appreciate.

The 12-15-h.p. engine, fitted to the smallest model, is, as has already been mentioned, somewhat different in design to those already described. It has, in the first

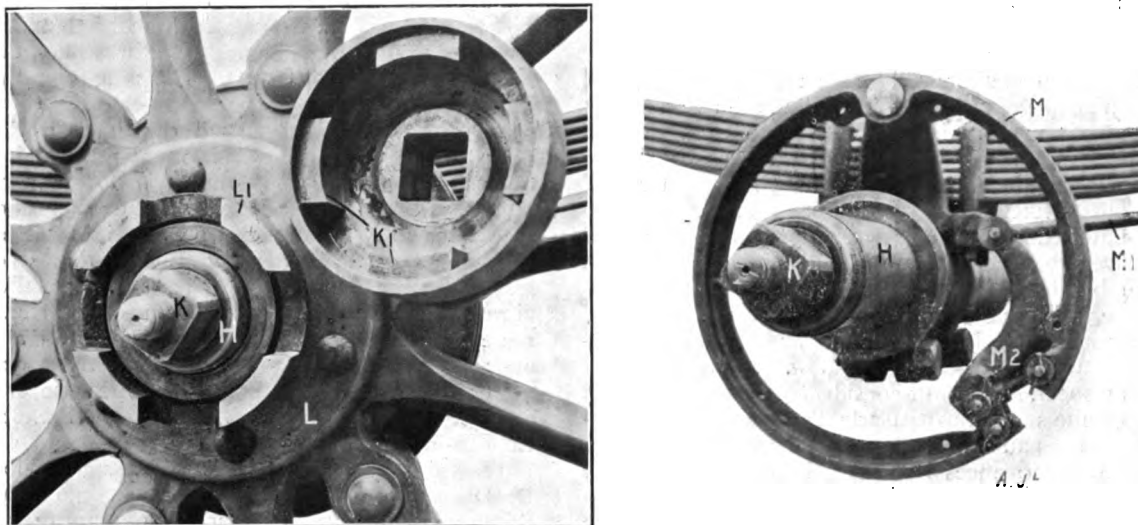


Fig. 8.—View of the Simms Live-axle Drive, showing (on the left) the wheel in place on the axle casing, and the two members, L¹ and K¹, of the jaw-coupling, and also (on the right) the extension of the axle casing, H, after the wheel has been removed. The brake, M, is also prominent in the right-hand view.

are operated by a hand-lever, which is connected to the brake rod, M¹.

The inner member, M, of the brake, which is prominent in Fig. 8, is formed by a single casting, and is supported by a bracket on the axle-casing, the natural springiness of the ring being relied upon to allow it to expand against the brake-drum when the brake is put on. A sprag is also provided, and is so arranged that it is

place, separately cast cylinders, of which the bore and stroke are 82 mm. and 90 mm. respectively, and the inlet-valves are arranged above, instead of alongside, the exhaust-valves. The cover over the cam-shaft is detachable, and, in order to enable the cam-shaft to be easily removed, the top halves of the intermediate bearings are only held down by springs, so that they, too, can be lifted off at the same time. This engine is shown

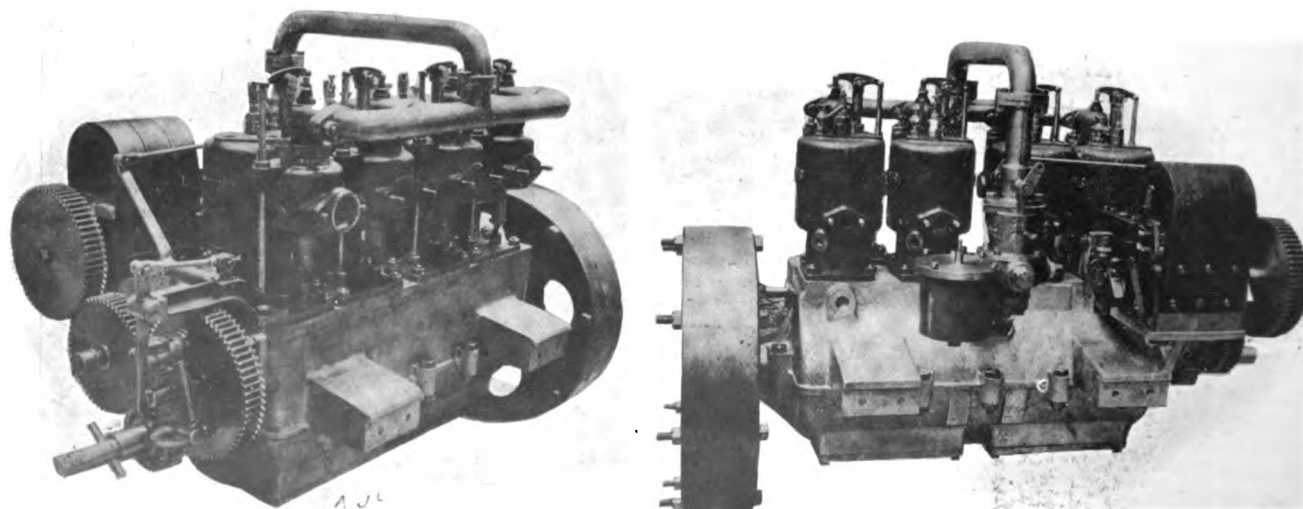


Fig. 9.—The 12-15-h.p. Simms Engine, showing (on the left) the valve-rods, and (on the right) the carburettor and high-tension magneto. The cover plates over the cam-shaft are detachable, and the top halves of the cam-shaft bearing are held down by springs.

from either side in Fig. 9, and the arrangement of the valves is clearly visible in these views. The inlet-valves are operated by long push-rods and rock-levers, the push-rods passing up through guides which project from the sides of the exhaust-valve chambers. The inlet-valves are fitted with small volute springs, which are arranged outside and are visible in our illustration. The upper ends of the short push-rods, by means of which the cam-shaft operates the valve-rods, are fitted with small caps which overlap the projecting part of their guides in such a way as to exclude dust.

The cam-shaft itself is carried by six bearings, of which the four intermediate ones have detachable caps, held in place by springs, as already said. The cams are milled from the solid, the inlet and exhaust cams being placed alternately.

The carburettor and the throttle-valve lie on the other side of the engine, and a pipe from the latter passes across over the top of the cylinder to join the common induction-pipe, which feeds all four cylinders. The throttle is under hand control, and is also connected with the governor, which is mounted on the end of the cam-shaft. Only high-tension ignition is fitted to these engines, a Simms-Bosch high-tension magneto being provided for this purpose.*

* For illustrated description see THE AUTOMOTOR JOURNAL, October 22nd and 29th, 1904.

Kiel Motor Boat Races.—The Kiel Regatta for motor boats, which takes place in conjunction with the Kiel week, consists of various events, to be held in the Bay of Kiel on Thursday, the 29th of June, while on the following day a long-distance run to Travemünde will take place. The events are open to boats from all countries, and H.R.H. Prince Henry of Prussia has consented to bestow his patronage on the regatta. The classification is as follows:—

- I. Racing boats classed solely according to length.
 - Class 1.—Craft of 18.01 metres to 25 metres. Horse-power unlimited.
 - Class 2.—Craft of 21.01 metres to 18 metres. Horse-power unlimited.
 - Class 3.—Craft of 8.01 metres to 12 metres. Horse-power unlimited.
 - Class 4.—Craft of 8 metres or under.
- II. Pleasure and touring boats (handicapped).
 - Class 5.—Craft with motors over 10-h.p.
 - Class 6.—Craft with motors of 10-h.p. and under.
- III. Fishing boats of all sizes and types, exclusively designed for the fishing industry (handicapped).
 - Class 7.—Fishing boats of 20 metres in length without bowsprit.
 - Class 8.—Fishing boats of not more than 20 metres with bowsprit.
(During the races these boats must not use their sails).

The length and arrangement of the course is the same as last year, and a flying start will be allowed.

In Classes 1 to 6 the prizes are honorary.

In Classes 7 and 8 money prizes will be given.

The Races Committee consists of the following gentlemen: Prof. C. Busley, V. Arnim, Dr. von Bleichröder, Freiherr von Brandenstein, Georg Büxenstein, Dr. Levin-Stoelting, Felix Simon, Graf von Talleyrand-Périgord, Capt. S. Wentzel, and the Prince of Hohenlohe-Oehring.

Another new type of engine which is now passing through the shops at Kilburn is one of 100-h.p. The four cylinders, which have a bore and a stroke of 165 mm., are cast separately, and the hollow nickel-steel crank-shaft is supported by five bearings, the lower caps of which are independent of the crank-chamber base. Both inlet and exhaust-valves are placed above the cylinder-heads, and are operated by a single cam-shaft which passes longitudinally over the tops of the cylinders, and is driven by a skew-gear from the crank-shaft. The engine is fitted with a Simms "Automatic" carburettor, and develops its normal power at 800 revs. per min.

Table of Reference Letters for the 20-24-h.p. Simms Chassis.

A	Float-feed chamber of carburettor.	C ¹	Governor levers.
A ¹	Jet.	D	Dash-pot for clutch.
A ²	Sleeve over A ¹ .	E	Driving shaft in gear-box.
A ³	Holes in A ² .	F	Sliding member.
A ⁴	Air inlet.	G	Driven shaft.
A ⁵	Passage past A ² .	H	Gear-wheel on E ² .
A ⁶	Spring controlling A ² .	I	Distance pieces on lay-shaft.
A ⁷	Spray cone.	J	Oil-tight sleeves for lay-shaft.
A ⁸	Induction pipe.	K	Reverse gear.
A ⁹	Throttle-valve.	L	Foot brake-drum.
A ¹⁰	Auxiliary air-valve.	M	Universal joint.
B	Magneto.	N	Cover for G.
B ¹	Igniters.	O	Axle case.
B ²	Tappet rods.	P	Axle.
B ³	Springs controlling B ² .	Q	Jaw drive.
B ⁴	Timing gear.	R	Hub plate.
C	Governor.	S	Jaw member on L.
		T	Hub brake.

IN CONNECTION with the rules issued by the German A.C. for the Kiel week are the diagrams which we here reproduce. These illustrate the points between which the length of the boat must be measured for the purposes of rating with the formula:—

$$\text{Rating} = \sqrt[3]{\frac{L \times N}{B \times T}}$$

in which L is the length along water line (see diagrams), N is the b.h.p. of the engine, B is the midship beam, and T is the draught amidships. For the purposes of handicapping, a table showing the average times for a knot, taken by boats of any rating, has been prepared, and the differences in these times will form the basis of the handicap in the cruiser classes.

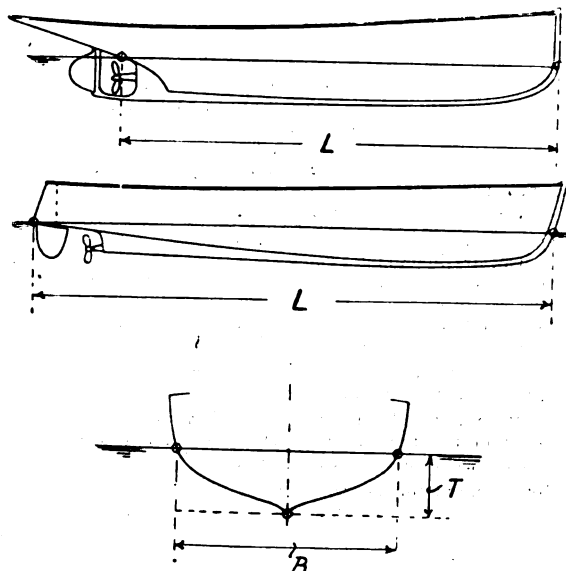


Diagram showing how the length, beam, and draught of a boat will be measured for the purposes of rating in the Kiel Regatta.

CORRESPONDENCE.

* * The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

THE DAILY PAPER PERIL.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—I called the attention of the House of Commons, in the course of the debate on June 1st, to certain cases reported in the public Press of accidents attributed to the reckless driving of motors, which, upon investigation, proved either not to have occurred at all, or to have had no connection whatever with motors. In fairness to motorists, I should like to call attention to a few similar cases.

The following paragraph appeared in the daily papers of June 3rd, 1905:—

"An elderly man, named William Haynes, was found, late on Thursday night, badly injured, on the Great North Road, between Buckden and St. Neots. He states that he was knocked down by a motor car, and the police are endeavouring to trace the car."

With reference to this case the Chief Constable of Huntingdon writes:—

"The cuttings from the newspapers of 3rd June, 1905, are worthy of about as much credence as a cutting from the *Daily Telegraph* of 24th May, 1905, that the North Road in the county of Huntingdon was 'sown' with hob-nails, pieces of files, &c. An old man was found badly injured, and a motor car was known to pass him, but he never stated that he was knocked down by a motor car, and, so far, there is no evidence that such was the case."

In the Press of May 22nd there appeared accounts of two cases—one at Cowbridge, South Wales, and the other at Binfield, near Windsor—of persons being left in a senseless condition on the road by motor cars. The *Manchester Guardian*, under the title of "The Perils of the Road—Callous Motorists," and the *Daily Mail*, in equally exaggerated phrases, described how a labourer near Cowbridge was found unconscious on the road on Friday morning. The latter stated that he had been knocked down by a motor car containing two men proceeding from Bridgend to Cowbridge about midnight. Investigation was at once made into this report, which was found to be pure invention. The police were satisfied that no motor passed through Cowbridge at the time, and that the accident was not caused by a motor.

In the second case, it was alleged that a young lady left home on her bicycle one afternoon, and when riding at a good pace down a hill in Tilehurst Lane a red motor car struck the pedal of her bicycle and she was thrown to the ground, the motor car proceeding on its way without stopping. Twenty minutes later she was found by a villager lying unconscious on the road, and did not regain consciousness until next day. As a result of their investigations, the police are satisfied that no motor car was concerned in the accident to the lady in question. Thus it appears that two accidents reported throughout the length and breadth of the land, in such a way as to inflame public opinion against the entire motor community, were not in any way caused by motor cars.

Many other cases could be cited, but I will give only one more instance. On the 13th June the Press published the following paragraph:—

"Mrs. Drabble, aged seventy-three, was walking last evening on the Duke's Drive, Buxton, with her niece, who is deaf, when, hearing a motor car approaching, she pulled the niece out of harm's way. The car struck Mrs. Drabble and hurled her over a stone wall. The occupants of the car drove away without rendering any assistance to the unfortunate lady, who was badly injured in the back."

The true version of this case is found in a letter, dated the 16th inst., received from the Chief Constable of Derbyshire, who writes:

"I have to inform you that there is absolutely no truth whatever in the report. Mrs. Drabble did fall over a wall at Buxton, but no motor car was in fault."

Motors and motorists are, of course, at the present time looked upon as fair game for attack, but we have a right to ask that the attack shall not be conducted by means of misrepresentation and misstatements.

I am,

Yours faithfully,

ARTHUR STANLEY.

Derby House,

St. James's Square.—June 20th.

SCOTTISH TRIALS.—A SHEEP ACCIDENT.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—A sheep was killed in the Scottish Reliability Trial by, apparently, one of the competitors, between Newtonmore and Dalwhinnie. One can only suppose that the driver of the car was under the impression that no damage had been done to the sheep, or that he could not trace the owner, as the owner (Mr. D. MacRae, Falls of Truim, Newtonmore) now states that he believes my Minerva car, No. 11, did the deed. This, however, I can prove otherwise, so that it is not in my interests, therefore, that I write you, but in the interests of the owner of the sheep, who has written me two most courteous letters, and is by no means an antimotorist. His claim is only £2, the value of the ewe and its lamb (since dead through loss of its mother), and which he cannot afford to lose, so the amount is not exorbitant. As the driver of the car cannot fail to know that he ran into the sheep, I trust that if this reaches his eye he will at once communicate with the owner at the address given above, and remove any false impression which may exist in Mr. MacRae's mind as to the gentlemanly instincts of motorists on account of the above incident.

Yours faithfully,

ERNEST H. ARNOTT.

TOURIST TROPHY RACE.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—During the present season I have received numerous entry forms for reliability trials, &c., from which it appears to me that special cars are required in numerous instances.

Early in the year a circular letter was sent to my company by the secretary of the A.C.G.B.I. with reference to the Tourist Trophy Race, in which the following paragraph appeared:—

"The Tourist Trophy Special Commission suggest that, although it is possible your present standard car may not fit the conditions governing the Trophy, it is only reasonable to assume, in view of the large influx of business which is certain to result, that you will at once take steps to make a car or adapt a standard car to conform to these ideal touring conditions."

A good suggestion, no doubt, but one not so easy to persuade a manufacturer with a large output to carry into effect whose existing standard specifications do not exactly "conform to these ideal touring conditions."

I have been asked on numerous occasions why we have not entered any De Dion cars for the Tourist Trophy, and had to reply, "because none of our standard models exactly complied with the conditions." For instance, the 10-h.p. De Dion should be a trifle wider in gauge, and the 12 and 15-h.p. De Dions are a trifle too heavy, that is, they are made stronger than is required by the "ideal touring conditions." Consequently, we shall have to be spectators only of the Tourist Trophy, and judging from the rules laid down, think (if it were not for our sales, satisfied letters from customers, and personal observation) that Messrs. De Dion Bouton and Cie., of Puteaux, do not yet know how to make an ideal touring car.

In last week's *Autocar*, "a would-be competitor" writes about the Bexhill programme, and states that he was desirous of entering his 12-16-h.p. car, but has no chance against £650 chassis cars. This being the lowest priced class catered for, was probably a reason for a great number of recipients of these entry forms consigning them straight to the W.P.B., and will probably account for a poor entry.

It seems to be time that new rules were drawn up which would give every maker a reasonable chance of success in such competitions with his standard vehicles. It should not be a difficult matter to formulate some rules wherein efficiency is not handicapped by the question of price. Many cheap cars may stand the trial for which they are properly specially prepared, but fail to keep up the reputation which they gain as the result of the trial for any length of time afterwards, or give even ordinary satisfaction to their owners.

Yours truly,
DE DION BOUTON, LTD.,
J. W. STOCKS, Manager.

THE TOLLS ON LITTLEHAMPTON'S PROPOSED BRIDGE—A CORRECTION.

To the Editor of THE AUTOMOTOR JOURNAL.

SIR,—My attention has only just been called to the extraordinary errors in regard to the tolls to be charged on the above proposed bridge which have recently appeared in your columns. It is absolutely untrue that the Littlehampton Council are asking for powers to enable them to charge 6d. per cwt. on all mechanical vehicles

that go over the proposed bridge, or that an ordinary touring car would have to pay 10s. or 12s., while a motor lorry might have to find about £6 before it could proceed on its journey. How such an extraordinary statement could ever have been invented or have found its way into print is almost beyond understanding. There has never been even a proposal to make any difference between motor and horse-drawn vehicles, or to raise the charge by one iota from the sum of one shilling in all, which motor cars in common with all four-wheeled carriages have now to pay to cross by the present ferry, with its highly-dangerous gradients, slippery banks, and delays, averaging about twenty minutes by day, and over an hour by night. Heavy motor lorries may, perhaps, incur some slight additional charge which, it is safe to say, would scarcely ever exceed an extra shilling.

As an enthusiastic motorist myself I would point out that this bridge, contrary to being a detriment to motorists, will open up for them by far the best, shortest, and easiest-graded road on the South Coast, by removing the one obstruction which has hitherto caused nearly all motor vehicles to avoid the spot. It is of the greatest importance that you should give this correction a prominent position, to overtake, as far as possible, the unfortunate and damaging mis-statement which has gone forth to the public.

Yours faithfully,

NEVILLE P. EDWARDS.

Chairman of the Bridge Committee,
Littlehampton Urban District Council.

[On receipt of the above letter, and thinking that there might possibly be some misunderstanding, we wrote, pointing out to Mr.

Edwards, that, although we were very glad to know that there was no *intention* of discriminating in the tolls between motor and horse-drawn vehicles, yet that the Bill contained a clause which would render such discrimination possible. The following is his courteous and very satisfactory reply. We also refer to this matter editorially on another page.—ED.] :—

SIR,—I am much obliged by your courteous letter of the 17th inst., explaining how the misunderstanding has arisen re the tolls on the proposed bridge at Littlehampton. The individual who discovered that we could apparently charge 6d. per cwt. for a motor car seems to have overlooked the fact that in quoting from the Schedule he was quoting the toll rate for hand carts from the old Ferry Act of 1824, at which time of course motors were not even contemplated. These clauses were only copied from the old Act at the request of the Lord Chairman of Committees after the Act was drafted—hence the misunderstanding. As a matter of fact, motors have never been charged under the paragraph referred to, but under the first paragraph of clause 50, under the head of "For every coach, chariot, chaise, &c.," and no one ever thought of increasing the one shilling at present charged for the ferry, which I ought to also mention includes a return ticket. However, to avoid the possibility of misunderstanding in the future, I have to-day instructed our clerk to write our Parliamentary Agents to have fresh wordings inserted.

Yours faithfully,

NEVILLE P. EDWARDS,

Chairman, Bridges Committee.



CLUBS AND ASSOCIATIONS.

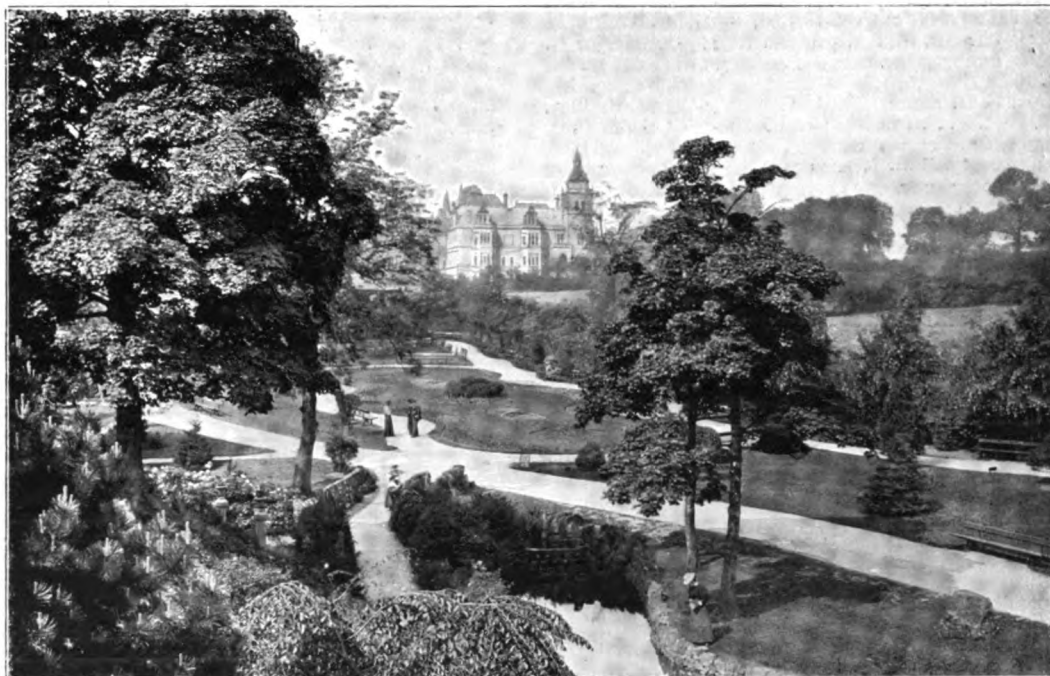


Photo by Photocrom Co.

The Valley Gardens, Harrogate. The Motor Union Meeting for this month takes place at Harrogate to-day (Saturday).

Automobile Mutual Protection Association.—The monthly meeting of the association was held last week, the president, the Earl of Shrewsbury and Talbot, in the chair. Mr. Douglas Mackenzie was appointed assistant-secretary to the society. The following firms were admitted to membership:—Messrs. Mors, Limited, Horner and Sons, Renault Frères, W. H. Willcox and Co., all of London; the Coventry Chain Company, Messrs. Royce, Limited, and Messrs. Stagg and Robson. Mr. A. S. Hill, of Coventry, was elected a member of council on the nomination of the chairman, seconded by Mr. John Marston. It was resolved to take active steps to extend the use of dustless materials in road

construction, and that a report should be brought up by the assistant secretary a month hence on this matter, when it is the intention of this society to devote a donation from its funds to further this important matter of public convenience. The Marquis of Londonderry, K.G., Sir David L. Salomons, Bart., Lt.-Col. R. E. B. Crompton, C.B., were re-elected as vice-presidents in accordance with the regulations of the society.

Berkshire A.C.—By invitation of Sir Gilbert and Lady Clayton East, a motor gymkhana was held by the members of the club on

Saturday afternoon, at Hall Place, Maidenhead, when an interesting programme was successfully carried through. The weather proved unexpectedly fine, and the running off of the various events was but slightly hampered by the heavy conditions of the ground. A large entry had been received, but many members of the club stayed away owing to the rain in town and other parts. The Bending Race was won by Mr. J. G. Carew-Gibson (8-h.p. 4-cylinder Humber); Lieut.-Col. W. Waring (24-h.p. Richard-Brasier) was second, and Mr. Oscar Thompson's 18-h.p. Siddeley (driven by Miss Thompson) was third. A Lady Passengers' Race, for 4-seated cars, gave rise to considerable amusement. The course was 220 yards, and each driver had to stop after about 100 yards, assist a lady from a chair to a back seat of the car, retake his own seat, drive about another 100 yards and pick up another lady as before, retake his seat and drive to the finish. The ladies were required not to rise from their chairs until the driver took them by the hand, and the door of the car had to be properly fastened after seating each passenger. Over-anxiety on the part of the drivers in gear-changing, and over-eagerness on the part of the ladies to rise quickly from their chairs, was distinctly noticeable. The winner proved to be Major E. R. Portal, chairman of the club, with his 16-h.p. Fiat, in 1m. 25s.; Mr. Oscar Thompson's 15-h.p. Wolseley, driven by Mr. E. Shrapnell Smith, was second in 1m. 33s., and Mr. Walter L. Bourke's 8-h.p. Cadillac was third in 1m. 35s. Tilting at the Ring was the next event; the winner proved to be Mr. F. T. Ford (28-h.p. Spyker), with Lieut.-Col. W. Waring (24 h.p. Richard-Brasier) second, and Dr. G. C. B. Hawes (7-h.p. Star) third. The fourth event was termed "The Motor House Race," the cars being required to start from a point outside hurdles arranged to represent a motor house, to drive forward about 30 yards, to stop on a given line, and to reverse into the improvised coach house. The driver had then to put his gear into the neutral position, and to raise his hand as a signal that he had done so. This was won by Mr. Oscar Thompson, driving his 18-h.p. Siddeley, in 23½s.; Mr. Walter L. Bourke was second, and Major L. Sandwith (8-h.p. Renault) third. The last event was a Tortoise Race, over a course of 100 yards, the order being, (last) Mr. Walter L. Bourke, (next to last) Mr. F. T. Ford, and (third prize) Major L. Sandwith. The arrangements were successfully carried out by Sir Gilbert A. Clayton East, with the assistance of the club committee, including Major E. R. Portal, Mr. J. G. Carew-Gibson, the Rev. J. W. Ouvry, Capt. E. F. Rhodes, Mr. E. Shrapnell Smith (hon. treasurer), and Lieut.-Col. W. Waring (hon. secretary). Mr. W. Rees Jeffreys, secretary of the Motor Union, acted as judge, and at the close of the proceedings Lady Clayton East distributed souvenir medals to the winners in each event as above. Upwards of 30 cars were present, but the president of the club, Field Marshal Earl Roberts, was prevented from attending.

Leicester A.C.—A very enjoyable gymkhana was held by the members of the club last Saturday at Neville Holt, the residence of Sir Bache Cunard. The building is in the Gothic style of architecture, and is situated on a high hill. From this point a splendid view of the surrounding country can be obtained. There is a church attached to the hall, which, in Cromwell's time, was the home of the monks, and the remains of their hiding-places can still be seen.

A gymkhana was carried out satisfactorily. The starter in the events was Mr. Cecil Banbury, and the judge, Mr. A. McAlpin.

The first event was a hill climb up Drayton Hill.

The second was a coach-house handicap, the first prize being won by Mr. Weight (40-h.p. Daimler), with Mr. Mawbey (15-h.p. Darracq) second. Mr. Durlacher (Rolls Royce) made a good third.

In event number three, which was a bending race, considerable amusement was caused by Sir Bache providing painted figures cut out of cardboard, instead of the usual staves. There was the boy who throws his cap under the car, the dog and the hen, the child with the hoop, the lady with the perambulator, and several others, finishing up with the policeman and his watch.



SIR THOMAS LIPTON has joined the North London Automobile Club.

Henley Regatta.—The A.C.G.B.I. have arranged with the Henley Regatta Committee for a part of Phyllis Court, where excellent accommodation is to be reserved for members' cars. Phyllis Court is immediately at the starting point, and one of the best positions from which to view the regatta. It is within

The lady's passenger race was won by Mr. Durlacher, with Mr. Barron second.

In the competition for appearance, which was judged by Miss Phelps Stokes, Mr. Byron was first, and Mr. Hardcastle (28-h.p. Mercedes) second.

Liverpool A.C.—On Saturday, July 15th, commencing at 2.30 p.m., a motor gymkhana is to be held by the club at the Liverpool Polo Club Grounds, Childwall. Five events are down on the programme for competition, viz., a Bending Race, a 200 Yards Sprint from a standing start (to be run in fours), a Lady Passengers' Race for 4-seated cars of club members only, Tilting at the Ring, and a Tortoise Race over a distance of 100 yards. In the latter, all cars will start together 40 yards from the starting line, on crossing which they must have their top-speed-gear in and complete the course without changing, the last car to finish to be the winner. Stoppage of the engine or change of gear will disqualify. The judges are Mr. J. A. Brodie, Wh.Sc., and Mr. A. L. Rathbone, J.P. Mr. E. A. Rosenheim will act as starter, Mr. Malcolm Blair as hon. timekeeper, and Mr. V. A. Simon as chief marshal.

The Motor Union and the Competition Rules.—In view of the objections which have been raised by the officers and committees of provincial clubs to the Competition Rules of the A.C.G.B.I., the chairmen and secretaries of all the clubs (over 40 in number) included in the membership of the Motor Union, have been convened by Mr. A. R. Atkey, the chairman of the Union's Special Committee on Club and Union relations, to a special meeting, to be held at Leeds on Friday, the 23rd June, at the Great Northern Hotel. The Hon. A. Stanley, M.P., has intimated his intention of being present at the meeting, the object of which is to consider the Competition Rules of the A.C.G.B.I. so far as they affect "closed" competitions, and the attitude of the provincial clubs thereto.

Scottish A.C.—The annual report of the club for the year ending January, 1905, shows a net total membership of 459, made up of 156 for the Eastern Section and 303 for the Western. For the year ending at the date of the report no less than 163 new members have joined. The cash balance for both sections is in a satisfactory condition and altogether the report is of a very encouraging nature. The club committee have throughout dealt with the various public questions which have arisen in a very commendable manner, and in regard to applications for speed limit, have taken each case on its merits in opposing applications. As an instance the application of the Burgh of Greenock, which referred to a small and congested portion of the town, being a reasonable one, was not opposed by the club. The following representatives to the General Council have been elected for next year:—Western Section—Messrs. H. M. Napier, W. H. Kingsbury, James Burns, with Messrs. John Adam (chairman) and Robert J. Smith (hon. secretary), *ex officio*. Eastern Section—Dr. Wm. Blair, Messrs. Stephen Smith and J. Dall Crombie, with Messrs. George Macmillan (chairman) and D. P. MacLagan (hon. secretary) *ex officio*.

MR. T. W. BROWNE, of Messrs. James and Browne, 395, Oxford Street, W., and 342, King Street, Hammersmith, W., has been elected honorary treasurer of the British Empire Motor Trades Alliance.

At a meeting held last week at Newcastle it was determined to form an Automobile Association for the County of Northumberland on similar lines to the County of Durham Association, the two to be amalgamated. Mr. J. W. Pease occupied the chair at the meeting, when between 30 and 40 automobilists were present.



half a mile of Henley station, and an excellent general view of the course can be obtained. There will be accommodation for about thirty cars, and luncheon marquees and cloak rooms have been arranged. Although ample catering arrangements will be made on the grounds, members can have luncheon baskets supplied by the club delivered to them on the course. The daily tickets are 12s. 6d. each, or 25s. for the three days, if purchased before July 1st.

RACES, RECORDS, AND TRIALS.



BEXHILL RACE MEETING.—Judges and officials at the finishing tape. The electric timing apparatus is seen fixed against the post, and the "tape" across the road.

Bexhill Meeting.—In our last issue we gave the winners of each event, and we are now able to supplement this information with the times taken by the holders of the second places.

Notwithstanding the presence of the racing cars, the event did not attract the same attention that the public displayed in last year's function, and the sides of the course were but sparsely populated with spectators.

There were practically no absentees among the cars, but the motor cycles did not turn up in full force. The times which we are able to publish are not necessarily the fastest times accomplished by the cars in question, and indeed other vehicles than the actual class prize-

winners made very good performances. Special mention may be made of Mr. Coleman's White steam car, for the excellent running of this vehicle was a demonstration of the successful manner in which that enterprising company have overcome the well-known difficulties in the way of steam cars competing in such events.

The success of the Daimler cars is remarkable, but not surprising, for they have an enviable record in such affairs. Against the times in the following table, which is compiled from particulars issued by the club—we give the equivalent average speed in miles per hour. These figures are not high, numerically, but it must be remembered that the starts were all made "standing,"



BEXHILL RACE MEETING.—The full course as seen from the Chalet at the Sackville, showing Galley Hill in the distance.



Secretary Orde starts the competitors. Mr. Stent's White steamer, No. 17, on the left, and the Beaufort, No. 10, on the right.

The Hallamshire and Beaufort just off on their heat.

BEXHILL RACE MEETING.

the distance of the kilom. run by the tourist section, including a stiff hill at the finishing end :—

Tourist Section.

All classes were timed over the standing kilometre.

Class A.—(Motor cycles, max. cyl. capy., 80 × 80), 5 entries.
1st, W. W. Genn's 2½-h.p. Minerva, 1m. 24½s. = 26.56 m.p.h.

Class B.—(Motor cycles, max. cyl. capy., 85 × 85), no entries.

Class C.—(Cars from £350 to £650 chassis price), 19 entries.—

1st, J. McDonnell's 28-h.p. Daimler, 55½s. = 40.22 m.p.h.

2nd, Capt. Theo. Masui's 24-h.p. Germain, 1m. 18½s. = 28.46 m.p.h.

Class D.—(Cars above £650 to £900 chassis price), 12 entries.

1st, Percy Martin's 30-h.p. Daimler, 50½s. = 44.2 m.p.h.

2nd, E. Manville's 30-h.p. Daimler, 54½s. = 41.11 m.p.h.

Handicap.

Class H.—Sweepstake open to Classes C and D, 12 entries.

1st, F. Coleman's 15-h.p. White steam car.

2nd, C. S. Rolls and Co.'s 15-h.p. Orleans.

3rd, F. Churchill's 15-h.p. Hallamshire.

No times were published for this event.

Racing Section.

Bicycles were timed over the standing kilom.

Cars were timed over the standing half-mile.

Class E.—(Motor cycles up to 110 lbs.)—

1st, H. H. Collier's 7-h.p. Matchless, 54s. = 41.4 m.p.h.

2nd, H. Rignold's 6-h.p. Rignold, 56½s. = 40.8 m.p.h.

3rd, W. Hodgkinson's 6-h.p. J.A.P., 58s. = 38.5 m.p.h.

Class F.—(Racers less than 650 kilogs.), no entries.

Class G.—(Racers up to 1,000 kilogs.), 5 entries.

Cars were timed for three runs.

1st, Lee Guinness's 100-h.p. Darracq, 32½s., 30½s., 31s., average 31½s. = 57.3 m.p.h.

2nd, Cecil Edge's 80-h.p. Napier, 33½s., 32½s., 32s., average 32½s. = 55.5 m.p.h.

3rd, Sir R. St. G. Gore's 100-h.p. Mercedes, 33½s., 32½s., 32½s., average 32½s. = 54.9 m.p.h.

4th, A. F. Calvert's 90-h.p. Mercedes, 35½s., 33½s., 35½s., average 34½s. = 52.0 m.p.h.

S. F. Edge's 100-h.p. Napier did not turn up.

Races at Welbeck.—Under the auspices of the Notts A.C., the programme of races was carried through on the Clipstone track, Welbeck, on Saturday last. The weather conditions were most unfavourable and depressing, rain falling in torrents during the whole meeting. It takes, however, a good deal of bad weather to frighten away automobilists from an event of this character, and practically the whole of the entrants without exception turned up to go through the programme. The arrangements were thoroughly well carried out by the officials of the club, with the assistance of Mr. W. Turner, acting



BEXHILL RACE MEETING.—Mr. J. E. Hutton's 90-h.p. Mercedes racer, starting for the standing half-mile.

Gordon Bennett Cup, 1905.

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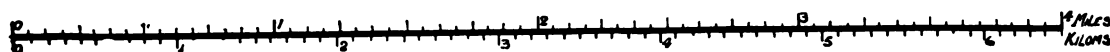
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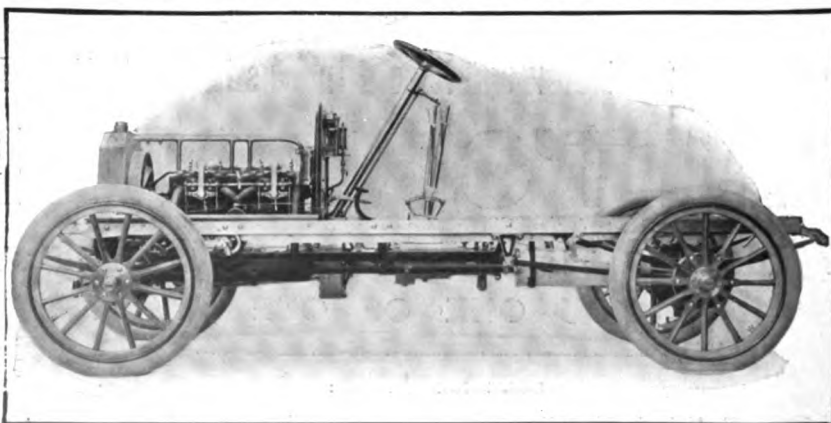


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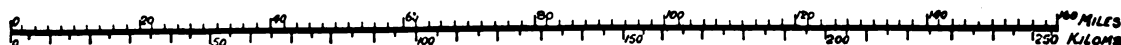
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BEXHILL RACE MEETING.—Mr. Lee Guinness driving his 100-h.p. Darracq at the finish of the course. This car made the best time of the day.

on behalf of the Duke of Portland. The first event was a speed-judging competition open to members driving their own cars over the flying kilometre. In this competition each competitor received a card, and after driving down the course, entered his estimate of the speed at which he had been travelling. If anything, the rain appeared to descend harder than ever during the running off of this item, rendering the track almost invisible to the drivers. Some of the estimates were extremely wide of the mark, whilst the winner of the gold medal even was about 7 miles out in his reckoning. The second competition of the same character, which was open only to non-motorists present, was necessarily somewhat of a barren event, owing to the absence of the general public through the fearful weather. None of the limited number, however, who did take part in this guessed the cars at above the legal limit, some of the estimates being absurdly wide of the mark. In one case a representative of the law credited a high-powered car with travelling 11 miles per hour only, an estimate which it would be interesting to see contrasted with an estimate of the same car at the same speed under different conditions.

The flying kilometre handicap for a valuable Challenge Cup presented by Mr. J. C. Wilson was the event of the day, and was the real attraction which had brought together the number of important cars. Owing to the continuance of the deluge of rain it was determined to combine with this event the final one of the scratch kilometre for a gold medal for the car

doing the fastest time, the performances in the handicap to count in the scratch event also. Run under these conditions, Mr. E. M. C. Instone on his 35-h.p. Daimler, succeeded in securing the gold medal for the fastest time, being slightly ahead of Mr. C. Hardy on a similar type of car, the next three following cars also being Daimlers of 30-h.p., driven respectively by Messrs. F. A. Bolton, W. M. Hutchinson, and E. P. Prestwich. The rest of the cars in order of merit were Messrs. M. Ross Browne, Richard-Brasier; J. C. Wilson, 28-h.p. Daimler; T. C. Pullinger, 16-20-h.p. Humber; F. Hardy, 14-h.p. Minerva; E. H. Arnott, 14-h.p. Minerva; Claud Johnson, 15-h.p. Orleans; T. A. Jolliffe, De Dietrich; M. McCraith, 14-h.p. Leader; Dr. R. G. Hogarth, 10-h.p. Peugeot; E. H. Joule, 14-h.p. Leader; P. Huskinson, 8-h.p. Rover; R. M. Wright, 8-h.p. Wolseley.

The winner of the Wilson Cup at the time of going to press has not been announced, as this has to be determined under the handicap rules of the A.C.G.B.I. The Cup becomes the property of any member winning it three times, this being the first occasion of the contest. Mrs. Shepherd, one of the only two lady members of the club, was amongst those who braved the elements and went through the whole programme. Amongst others present were Messrs. Booth Grainger (hon. secretary), A. R. Atkey, H. Belcher, and R. Cripps. The time-keeping arrangements were in the hands of Messrs. C. Perry, A. Osborne, and J. H. Scothern.



BEXHILL RACE MEETING.—Mr. Cecil Edge on his 80-h.p. Napier car, making a run down the course from Galley Hill.



BEXHILL RACE MEETING.—General view of the finish from the beach. Sir Ralph Gore's 100-h.p. Mercedes just reaching the top of Galley Hill.

Fromes Hill-Climb.—On Saturday last, June 17th, the Herefordshire Club held a hill-climb up the redoubtable Fromes Hill—the same which proved a stumbling block to many in the Small Car Trials. Twelve cars entered, and nine competed in the trial. The tabulated result given below is based on the following formula :—

$$\text{Marks} = \frac{6 + \text{Number of Passengers}}{1,500 + \text{Cost in } \pounds} \times \text{Speed (m.p.h.).}$$

Place.	Owner and Car.	Time. m. s.	Marks.
1	Colonel Hopton, 20-h.p. Wolseley ...	3 5	·0668
2	A. E. Pettifer, 15 h.p. Darracq ...	3 35	·0629
3	Mr. Banks, 12-h.p. Lanchester ...	3 29½	·0621
4	H. T. S. Morgan, 12-h.p. Darracq ...	4 9½	·0571
5	M. H. Orr-Ewing, 28-36-h.p. Daimler ...	3 3½	·0564
6	J. H. Hall, 12 h.p. Darracq ...	5 0½	·0477
7	H. G. Morgan, 12-h.p. Lanchester ...	5 1½	·0431
8	H. Graystone, 8 h.p. Wolseley ...	6 46½	·0288

Herkomer Cup.—About 75 entries have already been received for this event, including the one from Prince Henry of Prussia and Princess Charlotte of Saxe-Meiningen. The only French vehicles so far included in the list are two De Dietrich cars.

GORDON-BENNETT RACE.

This week we are able to publish some charming photographs of the Auvergne Circuit by the courtesy of Messrs. Michelin and Co., the eminent motor tyre makers, of Clermont Ferrand. This firm have availed themselves of the occasion of the Gordon-Bennett events on the Auvergne Circuit in every way to make known the glorious country which the course traverses, and in which the firm are naturally greatly interested. For this reason they have courteously placed at our disposal a number of views, some of which we reproduce this week, and which we think will be fully appreciated by our readers as showing the remarkable features of this wondrous course.

Amongst the firms who were prominent in their protest against the Auvergne Circuit for the running of the Eliminating Trials were the Richard-Brasier, De Dietrich, and Darracq houses. It is, therefore, somewhat curious that under these circumstances two Richard-Brasiers and one De Dietrich car should be the winning cars, whilst the Darracq is the first of those not classed for the team.

In regard to the practice on the Auvergne Circuit, notice has been issued that the special bridges which have been constructed are not allowed to be traversed, and competitors are only permitted to race on the course three times per week, between 4 and 7 a.m.



Photo by Argent Archer.

BEXHILL RACE MEETING.—A remarkable group of Daimler tourist cars at the Bexhill Meeting.

With the running of the French Eliminating Trials, the full list of starters for the race itself on July 5th is now available. This list of the cars and their drivers is as follows:—

France:—

Richard-Brasier (Théry).
Richard-Brasier (Cailliois).
De Dietrich (Duray).

Great Britain:—

Napier (Earp).
Wolseley (Rolls).
Wolseley (Bianchi).

Italy:—

Fiat (Lancia).
Fiat (Cagno).
Fiat (Nazarro).

Germany:—

Mercedes (Jenatzy).
Mercedes (de Caters).
Mercedes (Werner).

America:—

Pope Toledo (Lytle).
Pope Toledo (Dingley).
Locomobile (Tracy).

Austria:—

Mercedes (Burton).
Mercedes (Braun).
Mercedes (Hyéronimus).

The order of starting, so far as the countries and their respective numbers and colours in the race are concerned, will probably be as follows:—

France (Blue), 1, 7, 13. Austria (Black and Yellow)
England (Green), 2, 8, 14. 5, 11, 17.
Germany (White), 3, 9, 15. America (Red), 6, 12, 18.
Italy (Black), 4, 10, 16.

Switzerland have, as announced some time ago, determined to take no part in the race, in consequence of the amount of the expenses which, at the International Conference of the clubs, it was decided to apportion to each club taking part in the race. Messrs. Dufaux, who had entered three of their vehicles, as already stated by us, refused to recognise the right of the Swiss club to saddle them with this cost in addition to the entry fees which had already been demanded, and which Messrs. Dufaux had paid. They have, not unnaturally, therefore, under the circumstances, given notice that they do not propose to start. Thus Switzerland, in addition to Belgium, who were both represented in last year's race in the Taunus, will not take part this year. On the other hand, the American cars are already in France,

ready for participation in the event, making altogether 18 which may be expected in line at the actual start.

Vanderbilt Cup.—In accordance with the arrangements made for the selection of the French representatives for this Cup, the first five in the French Eliminating Trial for the Gordon-Bennett Race who had entered for it, are those which will represent that country. The following are the cars and their drivers, therefore, which will take part in the race in America:—1. Richard-Brasier (Théry); 2. Richard-Brasier (Cailliois); 3. De Dietrich (Duray); 4. Darracq (Wagner); 5. Renault Frères (Sisz); with, as reserves, Panhard-Levassor (Heath), and Hotchkiss (Le Blon).

Austrian Hill Climb.—Last Sunday, a hill-climbing competition was organised by Count Schoenborn, the vice-president of the Austrian A.C., upon his private property near Vienna. The entries were by invitation, and the hill selected at Buchheim was over 2 kiloms., with a 13 per cent. gradient, rendering the test a very severe one. The results were:—

- Cat. 1.* 2-seated voiturettes.—(1) 6-h.p. De Dion, 3m. 42s.; (2) 6-h.p. Oldsmobile, 4m. 7s.
Cat. 2. Voiturettes with 1 passenger.—(1) 6-h.p. Maurer, 3m. 37s.; (2) 6-h.p. Oldsmobile, 3m. 37½s.
Cat. 3. Light cars, 2 passengers.—(1) 20-h.p. Darracq, 2m. 35s.; (2) 20 h.p. Durkopp, 3m. 6½s.
Cat. 4. Light cars, 1 passenger.—(1) Spitz, 2m. 18s.; (2) Darracq, 2m. 21s.
Cat. 5. 30-h.p. cars.—(1) Spitz, 2m. 25s.; (2) Richard-Brasier, 2m. 40s.
Cat. 6. 24-h.p. cars.—(1) Mercedes, 2m. 22s.; (2) Mercedes, 2m. 29s.
Cat. 7. Light racing cars.—(1) 24-h.p. Spitz, 2m. 4½s.; (2) 24-h.p. Spitz, 2m. 29½s.
Cat. 8. 45-h.p. cars.—(1) Mercedes, 1m. 51s.; (2) Mercedes, 1m. 55s.
Cat. 9. Racing cars.—(1) 100-h.p. Mercedes, 1m. 13½s.; (2) 70-h.p. Lohne Porsche, 1m. 22½s.



We recently gave a brief description, and some illustrations, of the Dufaux Racing Cars, which were built to represent Switzerland in the Gordon-Bennett Race. The above photograph shows one of the 8-cylinder 100-h.p. models being put through its paces on the Continent by Mr. C. S. Rolls, whose firm have now acquired the British rights for the Dufaux racing and touring cars. The makers are, we understand, now building a special 8-cylinder track racer of 150-h.p. for Mr. Rolls.

INDUSTRIAL ALCOHOL.

(Continued from page 746.)

COL. HOLDEN, R.E., said: Almost everything that could be said about the use of alcohol has been said, but there are one or two points that perhaps have been omitted. I think in the use of alcohol we must confine our attention entirely to the self-propelled vehicle. It is not likely in this country where coal is cheap, and where oil, I mean petroleum, is comparatively cheap, that we are going to see alcohol used, or that anybody is going to think about using alcohol for stationary engines. The oil engine as it is irregularly called, has been perhaps treated with some sort of disdain to-night, and one or two of the speakers said it was not much in use. But the oil engine has been very largely used in this country for electric lighting purposes, and it will continue to be used as long as it is proved that it is cheaper than other engines. It is an engine which can develop a h.p. or an i.h.p. for as little as a twentieth of a penny per hour, and that is far below anything that alcohol can do, and therefore the use of alcohol must be confined to the motor car engine. I must confess I am not particularly sanguine as to the use of it. It has advantages, but I am afraid the disadvantages are rather serious. The chairman referred to the Government, or rather to the War Office, and their use of the fuel for internal combustion engines, and I should like to say we are most anxious to get a fuel that is absolutely safe. We all realise that petrol is absolutely safe when you once get it into the engines, but it is the storage of it in large quantities that makes it dangerous. The disadvantages of alcohol are somewhat similar to the disadvantages of the heavy oil. That is to say there is the trouble in starting. I do not think that that has been got over. As far as military wagons are concerned we have not found great difficulty in getting an engine started, and starting an engine when it is once hot with the heavy oil. I am not so sure that we have complete safety from explosion with alcohol. I have only made experiments on a small scale, but if you want a fairly good explosion you ought to take a bottle of methylated spirit, shake it and apply a light to it and you will get a very good one. If that is the case one must not say it is absolutely safe. I am prepared to admit that it is much safer than petrol, but I do not think it is absolutely safe, although I have heard it so stated.

Dr. Squire said: With the use of alcohol in an internal combustion engine used for motor purposes, the arguments do not appear very favourable at the present time. If you compare alcohol we find that when it is dissolved that it produces in decomposition about 7,000 calories. I am speaking in the metrical system, because in the British term of units it is perfectly unintelligible. Well petrol produces about 11,000 calories, so that alcohol is more than half as good as petroleum, but to add to that we have to take off about 7 per cent. representing the water with which alcohol is always mixed. So that when this is done alcohol produces only about half the effect of petroleum. Chemically it requires about four parts of alcohol as against petroleum. Now is it possible to reduce the price of alcohol? Certainly alcohol which is made in the usual way in Great Britain is hardly capable of being reduced. The present absolute cost of spirit per proof gallon is about 10d. I heard it said that the price of 10d. a gallon was a suitable one for bulk spirit, but spirit of 93 per cent. at 10d. per gallon is absolutely impossible. But even at the present price, although the alcohol industry might be described as a monopoly; well it may be a monopoly, but it does not pay. I believe that I myself am partly the cause of it. Many years ago I started the maize industry. I think it was considered to be a nice little bye-product, and that it would help alcohol. It has done nothing of the kind, and people have been obliged to make more alcohol than they could possibly sell. Consequently the alcohol industry is in a very bad condition indeed. It is said that the alcohol industry is a monopoly, but two distilleries were broken up about three years ago, so that the monopoly does not appear to be a very profitable one. It has been proposed that spirits should be made from potatoes. Well it is done very successfully in Germany, but last year the price of the spirit in Germany, owing to the comparative failure of the crop of potatoes, was actually higher than the price of the spirit made from grain. Still that was an exceptional case. The question is would it not be possible to make spirit very much cheaper from potatoes? Of course as soon as potatoes are mentioned people at once fly to the idea that this can be made an Irish industry. I do not think it is very easy to create an Irish industry. The potatoes must be grown in a certain way. A certain amount of expense is necessary for manure for the land. According to the German system they supply the manure in this way. The idea there is that the potatoes shall be taken from the soil, shall be broken up, the alcohol extracted from it, and the whole of the other parts of the potato returned to the land. Well, that idea is practical, scientific, and logical. The alcohol comes entirely from the air; there is not a particle comes from the soil, so that if you

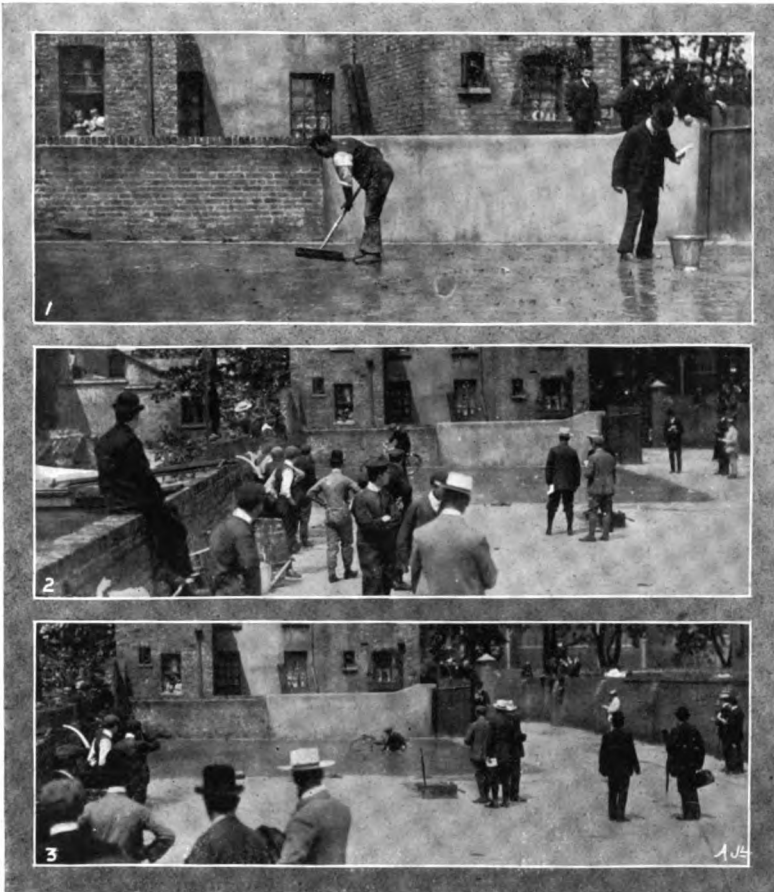
put everything back to the earth, instead of getting alcohol which comes from the earth, you eliminate the soil completely. But you cannot carry that system out on a large scale, and for this simple reason, that in order to do this you would have to have a very large amount of canalisation. In Germany these agricultural distilleries are small. They must be small, because there are about 20,000 of them, and the making of agriculture in that way is simply an agricultural operation. The potatoes are grown in the summer, and in the winter the potatoes are taken into the distilleries; and some of these distilleries you can hardly believe how small they are. But the spirit is produced, it is collected by the factors, and taken to the large distilleries in Leipsic and other large centres, where it is made into something like decent spirit. It is terrible stuff when you send it first to the distilleries. Well, as a rule there, the master of the house works, and his wife works, and his daughters and sons work, so that he pays very little in wages, and the thing is carried on in a way that I do not think could be done in Ireland or in any other country practically. Whether spirit can be produced in a cheaper way or not, I do not know. There is a process which I do not think will eventuate in anything, and that is in making spirit from sawdust. It has been pushed in the lumber regions of America, but so far the result has not been at all satisfactory, and I do not see how spirit can really be produced in that way. And unless petrol goes up very considerably in price, I do not think it is possible to compete with it. If the price of petrol goes up, as very likely it will, then it may be a question as to how far alcohol can be brought in. At present, I do not see my way to it becoming a spirit in this country in any other way. I may mention, however, that in American distilleries with which I am acquainted, the spirit is cheaper than it is here, because it is made in the large distilleries which are only about 6 feet above the surrounding land. But it is all corn land, so that really the corn has no carriage to pay; it is simply cut and shovelled into the distillery. I see it mentioned in the report, which certainly is most impartial and most painstaking, that there is a large distillery near Berlin which produces 25,000 gallons of spirit per year. Well, several large distilleries in England produce twice that in a week (laughter), and in America I went through one distillery which produced that in a day, so that the scale is quite a different one. The spirit there would cost at most at the present prices about 8d. a proof gallon, but then it is only fair to state that the proof gallon in America is the old wine gallon in England. They have stuck to that, and they have not stuck to the Imperial gallon at all. Further than that, I do not think I can give you any information.

Professor Boys, C.V., F.R.S., said: When we come to the question as to alcohol and its use—I am not referring to its industrial use at all, but confining my remarks to the use of alcohol in internal combustion engines—when I come to that question, as I said before, we have not produced any case of an urgent character at the present time. Our only grievance is a hypothetical grievance as to what might happen if certain things occurred which have not occurred, and which many people say never will occur. With regard to the difficulty of driving an internal combustion engine, because of the production of acid and the corrosion, especially in the exhaust-valve. If acid is formed in an alcohol engine it indicates that the carburettor is imperfect, that there is insufficient oxygen. That, of course, is to be remedied in an improved carburettor. But one of these troubles in this matter of alcohol is this, that if you do not get the real proportion of oxygen to fuel you do get objectionable chemicals, whereas with petrol there is no objectionable chemical. The difficulty of running with alcohol in cold weather. Well, that is not a question of very great difficulty, because it is possible to arrange a certain amount of heat in a by-pass more reasonably on alcohol than on a heavy oil. The difficulty in starting, I am bound to admit, has not been overcome any more than it has been done either for heavy oil, lamp oil, or petroleum. My idea is that seriously we have nothing to complain of at the present moment. Alcohol and its use in engines I believe to be quite possible, shortly possible, in the future, and not by any means the hopeless problem that some people imagine, but it is not ripe simply on the grounds of the question of cost. If, as Dr. Ormandy suggested, alcohol is going to be made from cellulose, the problem becomes infinitely more important. Alcohol from potatoes, &c., gives people an unpleasant turn. The destruction of food by the wasting of it no one can regard with satisfaction, but if we can get alcohol from the waste product of wood mills, so as to make it cheap and sufficiently pure, then its use assumes entirely other proportions, but at the present moment my own feeling is that we shall have to increase the range of the petrols by including those of greater density than those now in use. Finally, if we are driven into a corner, we shall adopt a double tank, which will be a nuisance, but which will enable us to go on.

Col. Crompton said: It only wants petroleum prices to rise to

make manufacturers turn to the heavier oils. I am quite sure that if motor manufacturers chose to, and were forced as they are likely to be forced by the mere development of the motor 'bus industry, for instance, which in a very short time will take at least a million gallons per annum in London alone, and probably two or three million gallons, within a few years we shall see such a demand for spirit fuel of a specific gravity of .75 that they will be forced to deal with fuel with the highest specific gravity. And those who are wise among them, instead of extending their energies in developing

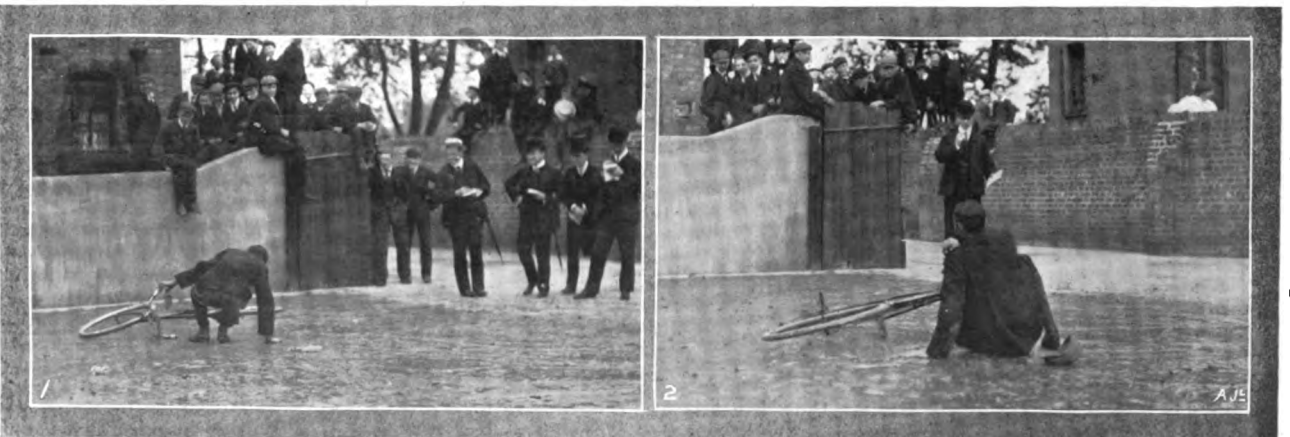
alcohol at present, will turn their attention to the heavy oils for further fuel, and they will with absolute certainty develop the means of using the cheap and heavy oils. When we consider the enormous supply of oils, largely at 3d. or 4d., which cannot be dealt with, we can see what an enormous future there is before an engine that is used by the motor manufacturers when they can get hold of the proper evaporiser and atomiser. I believe the secret is in the mechanical means of producing a cloud of finely-divided oil, then heating it in such a manner that you do not crack it.



1. Mr. Basil Joy preparing the greasy surface at the Cadogan Garage.
2. A successful turn on the prepared surface. 3. An unsuccessful essay.
ANTI-SKID TESTS OF THE C.T.C.



ANTI-SKID TESTS OF THE C.T.C.
—One of the competitors and his device which successfully travelled over the greasy patch.



ANTI-SKID TESTS OF THE C.T.C.—A study in methods of taking the fall and in its effect upon the officials and spectators. Of the 31 devices which took part, 8 survived these tests at the garage, and, of them, 5—having got through the road trials without serious mishap—are yet to undergo further trials.

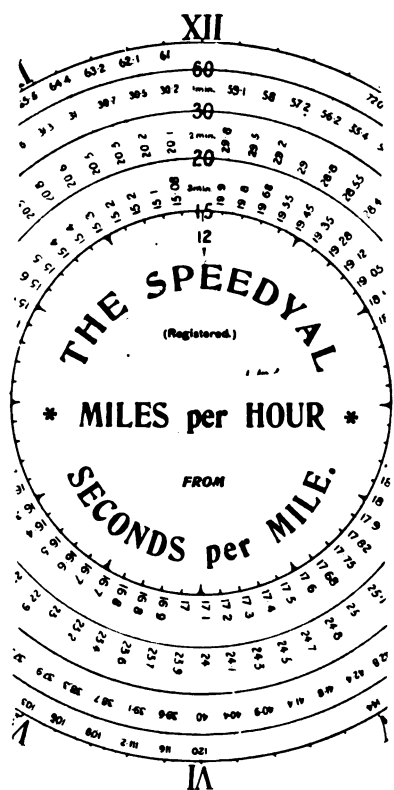
MOTOR CYCLING.

Irish Motor Cycle Union—Ariel Cup.—Splendid weather favoured the Irish Motor Union on Saturday last on the occasion of the annual two hundred miles non-stop reliability run. The course was from Dublin to Waterford and back, starting and finishing at Inchicore Bridge. The Ariel Cycle Company, Limited, presented the cup, which was won last year by T. W. Murphy, who had but to win it again to make it his own property. The conditions of the contest drawn up by the donors confined the event to British-made machines, and the committee limited the pace to 20 miles per hour, or not less than 15, a minimum and maximum time being fixed, excess of which would disqualify. Out of an entry of five, three put in an appearance at the start, the thunderstorm of the previous night no doubt accounting for this, and at 8 a.m. Mr. Coleman O'Connell sent the following away:—T. W. Murphy, 3-h.p. Singer (holder); L. Summers, 3-h.p. Triumph; and V. Mayne, 3-h.p. Singer.

Waterford was reached without incident, and on the return journey Summers punctured outside Thomastown, but riding on the rim got to Carlow before retiring from the contest. After passing Castledermont, V. Mayne next had trouble, his back tyre going down, but riding on he did not succeed in reaching the timing line before the maximum time had expired. T. W. Murphy got to Inchicore within a few minutes of twelve hours from the start, and reported a non-stop run, and, being the only competitor to get through, won the cup outright. This is the second challenge cup won by Mr. Murphy during the present season.



The "Speedyal."—Numerous "ready reckoners" for enabling the speed of a car in miles per hour to be ascertained have already been put on the market, the latest of these to come before our notice being the



"Speedyal," which is arranged in a very ingenious manner. It gives the speeds that correspond with different times occupied in covering one mile.

The figures representing miles per hour are all set out in four concentric circles, as seen in our illustration—which shows a part of the complete dial—and the time in seconds are denoted clock-fashion only, around them. The Roman figures, although apparently hours,

Glasgow Motor Cycle Club.—Last Saturday, the 17th inst., this club carried out a penalty non-stop run on the lines of those which have been organised by the Auto Cycle Club. The route to be covered was from Glasgow to Ayr and back, each stop carrying a penalty of 6d., while failure to finish within the prescribed time involved a penalty of 2s. 6d. One half of the route on the return journey—the part between Ayr and Fenwick—was deluged by torrential rain, which made the conditions very trying both for man and machine. The results were as follows:—

J. S. Bryce, 3-h.p. Quadrant ...	...
S. Glanfield, 3½-h.p. Minerva ...	...
Fred F. Meaton, 3½-h.p. White and Poppé ...	...	} Non-stop.
Wm. Hutchison, 1½-h.p. Clement Garrard ...	...
James Nicol, 3-h.p. Centaur ...	...
J. S. Fulton, 2-h.p. Clement Garrard	One stop (water in contact-breaker).	
A. F. Sinclair, 1½-h.p. Indian ...	Outward journey, non-stop return journey, unfinished (mud in carburettor).	
J. Caldwell, 2½-h.p. Excelsior ...	Outward journey, several stops through tyre troubles. Return journey unfinished.	
James Eadie, 2½-h.p. Excelsior with side car	Retired (engine overheating).	
W. A. Thiem, 1½-h.p. Excelsior...	Retired (tyre troubles).	



as on a clock, really stand for 5, 10, 15, &c., seconds, and, in fact, we are inclined to think that the "Speedyal" would be improved if it were so marked, even though the method adopted may appeal with special force to users of stop-watches. It will be noticed that all the figures representing miles per hour are arranged so as to correspond radially with the sub-divisions denoting seconds, so that it is only necessary to take the required number of seconds on the dial and read inwards in order to ascertain the speed. If the time is less than one minute, the outer circle of figures should be taken, but if it exceeds one minute, the next inner circle gives the correct answer. There are four circles in all, and thus the "Speedyal" can be used for any speed exceeding 15 miles per hour, i.e., for times not exceeding 3m. 59s.

As an example, let us suppose that a car is timed to cover a mile in 2m. 34s. Firstly, taking the fourth sub-division after the VI. (30s.), and reading radially inwards, it is seen that the speed would be 105 m.p.h. for 34s., 38.3 m.p.h. for 1m. 34s., and 23.4 m.p.h. for 2m. 34s., this last-mentioned figure being that required. The "Speedyal" has been published by Mr. Wilson of Stockport, and on the reverse of the stiff varnished card on which the dial is printed, are lighting-up tables, registration letters, and other useful particulars for motorists.

The "Yellow Press" with a Vengeance.—Automobilists were generally more or less surprised and alarmed one day last week to observe the bills of a Radical evening paper bearing the alarming heading "A Motor 'Bus Smash. Several People Injured." The motor 'bus has done so well since its introduction in the Metropolis, that this was naturally a shock to most people. It transpires, however, that the terrible smash was due to an electric tram at Shepherd's Bush colliding with a motor 'bus, and that but for the immobility of the former conveyance the accident would not have occurred at all. Why this should have been designated a "Motor 'Bus Smash" rather than an "Electric Tram Smash" we leave to our readers to divine.

The Pygmies' Outing.—The record price ever proposed for a complete automobile has been refused by Mr. W. M. Letts for a 9-h.p. Oldsmobile. He was



The five Pygmies in a 9-h.p. Oldsmobile outside the Hippodrome, ready for their first motoring experience (a run to Crawley). The front seat is occupied by the Chief.

offered a spear, a bow, and its full complement of arrows, for a 9-h.p. Oldsmobile, and he positively refused the offer! This munificent proposal was made by the Chief of the Pygmies who are now at the Hippodrome, as the result of his delight and that of the other Pygmies with the motor car trip to which Messrs. Jarrott and Letts treated them on Sunday last. Mr. Letts is becoming a regular benefactor to the Hippodrome, and not long ago we chronicled the outing he gave to the Russian giant. Last Sunday he went to the opposite extreme, and loaded up his Oldsmobile cars with the little people, who were driven to Crawley and back again. They were highly delighted, particularly when the car travelled at speed, when they executed something approaching a war dance, and jabbered away as hard as they could. Just before ten o'clock the Oldsmobile car drew up at the Hippodrome, and the little people took their places inside it. It was explained to them that they were going for a long distance into the White Man's country, so they took their spears, bows, and arrows, to

protect themselves against any wild tribes they might encounter. One of the photographs shows them just after mounting the cars. All the Pygmies went for the drive with the exception of one old lady (she has attained the advanced age of 32), who was considered too antique for the journey. They were attended by a regular cavalcade of 15 cars in all, 9 of which were Oldsmobiles, and they pronounced the whole outing to be "umgari," which, we understand, is Pygmyese for "very fine indeed." The air and motion proved a little too much for most of them, and they slept a good deal on the way, all excepting the Chief Mongogo, and he remained a little too active, for, it is rumoured, he drank up a portion of the lubricating oil, and poured the rest into a part of the mechanism where it did no good. But he appears to be none the worse for the treatment he subjected himself to, and will, no doubt, be soon approached by the manufacturers of the oil to write them a testimonial. In the two photographs, the Chief Mongogo is to



The three Oldsmobiles with the Pygmies on their way back from Crawley. The Princess is in the front car, and the Chief in the last.

be seen in the 7-h.p. runabout, while the Princess is seated in the 9-h.p. tonneau. Views of the Pygmies' outing now form one of the cinematograph exhibits at the Hippodrome.



ONE would have hardly thought it possible, considering the publicity given to Mr. Edge's experiments at the Crystal Palace recently, demonstrating the superior stopping power of automobiles as compared with horse-drawn vehicles, that there could be man, woman, or child in the Metropolis who read the daily papers, that had not heard about them, and what they triumphantly demonstrated. Mr. Coroner Troutbeck, however, seems never to have heard of the experiments, and when holding an inquest on a woman who was recently knocked down and killed by a motor brougham in Trafalgar Square, calmly declared that the stopping powers of motor cars were inferior to those of "other forms of traffic." If Mr. Edge ever thinks

fit to repeat the demonstration he gave at the Crystal Palace we would recommend him to have a few coroners, and particularly Mr. Troutbeck, present. In the meantime, considering the important official position he occupies, it would not be amiss should Mr. Troutbeck in future think fit to devote some portion of his time to the perusal of the daily papers, so as to make himself to some extent acquainted with ordinary items of news and the general progress of events.

British International Cup for Motor Boats.—The Automobile Club of America, we learn by cable, have entered two motor boats in this contest, taking place on September 11th at Arcachon.



One often hears the term "sky-pilot" used in a more or less metaphorical sense. But the title is an actual one in France, and it has been conferred on Mr. Frank Butler who, everyone knows, is a veteran aeronaut. We give herewith a reproduction of the actual certificate as an aeronautical pilot which has been granted to Mr. Butler by the Aero Club of France. Mr. Butler has, of course, the French licence as a competent motor car driver, and also has a steam launch licence from the Thames Conservancy, and another for an electric launch, so that, as he says, with licences for air, land, and water, he is well provided for.

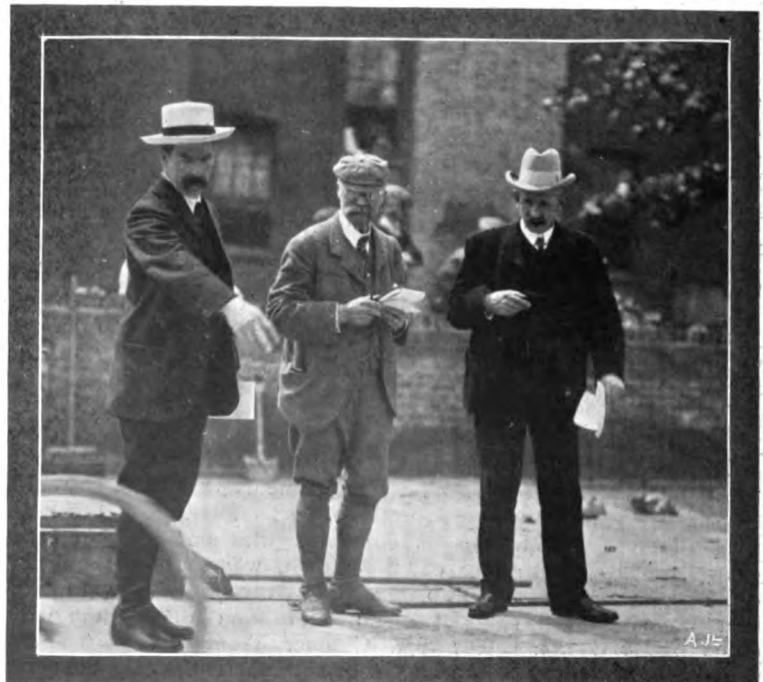
If the example set by Mr. Frank Butler is generally followed, one of the fashionable methods of paying afternoon calls is likely soon to be by balloon. On Saturday last Mr. Butler, in his new balloon *Vera*, accompanied by Mons. Rene, of the Aero Club of France, ascended at the Crystal Palace, and gave practical evidence of his right to hold his certificate as a "pilote-aéronaute." The balloon proceeded in the direction of Sevenoaks, and descended with great accuracy in the grounds of Mr. Leslie Bucknall, a fellow member of the Aero Club and a great friend of Mr. Butler himself, where the voyagers were hospitably entertained. In the course of the journey Mr. Butler attained an altitude of 35,000 ft.

SEVERAL well-known automobilists were caught in an unexpected police trap on the Ripley Road on Sunday, the 4th inst. They all have received, or are expecting to receive, summonses, though, we are informed, the trap was laid at a part of the road where there was no other traffic, not even school children, or dogs playing in the highway, and sparrows constituting the only traffic which "was or might be expected to be upon it." Several of the gentlemen in question are anxious to combine and share a solicitor for the defence, and we have accordingly been asked by some of them to make known this suggestion, which we have accordingly much pleasure in doing. Should any of our readers, therefore, who were caught in this trap, and are willing to combine to share the services of a solicitor in the manner suggested, we will (privately) make their desires known to each other.

THE electric launch was a prominent feature in a very enjoyable trip on the Thames arranged by the proprietors of Skindle's Hotel, Maidenhead, on Friday of last week, when a pleasant gathering of friends had demonstrated to them that the reports of recent floods were much exaggerated. The Thames Valley, it was clearly shown, is at its very best at the present time.

MONDAY last was the occasion for the 1905 issue of the excellent annual "Holiday Number" of the *Financial News*. This takes the form of a 36 pp. book, in which all the leading seaside pleasure resorts in Great Britain are carefully set out, the chief features and attractions in each being given, whilst the towns are conveniently sub-divided under British Holiday Resorts, London, Bonnie Scotland, Ireland, the Lake District, Manx Land, the Isle of Wight, Up the Thames, and Holidays Abroad.

ILLUSTRATION of the gradual diminution of prejudice, on which we have had occasion from time to time to congratulate the industry, is furnished by the case of George Harris Hendasyde, against whom a jury returned a verdict last week of manslaughter in connection with the fatal motor car accident at Colnbrook on the 2nd of April last. The Judge, after stating that he fully agreed with the jury's verdict, sentenced Hendasyde to four months' hard labour—a sentence which it must be admitted was a singularly light one when a verdict of manslaughter with which the Judge declares agreement has been returned.



ANTI-SKID TESTS OF THE C.T.C.—Some of the chief officials directing operations. Mr. E. R. Shipton, the Secretary of the C.T.C. is in the centre, with Mr. J. D. Sutcliffe, of Manchester (the Chairman of the Anti-Side-Slip Committee), on the left, and Mr. James Lennox, J.P., of Dumfries, on the right.

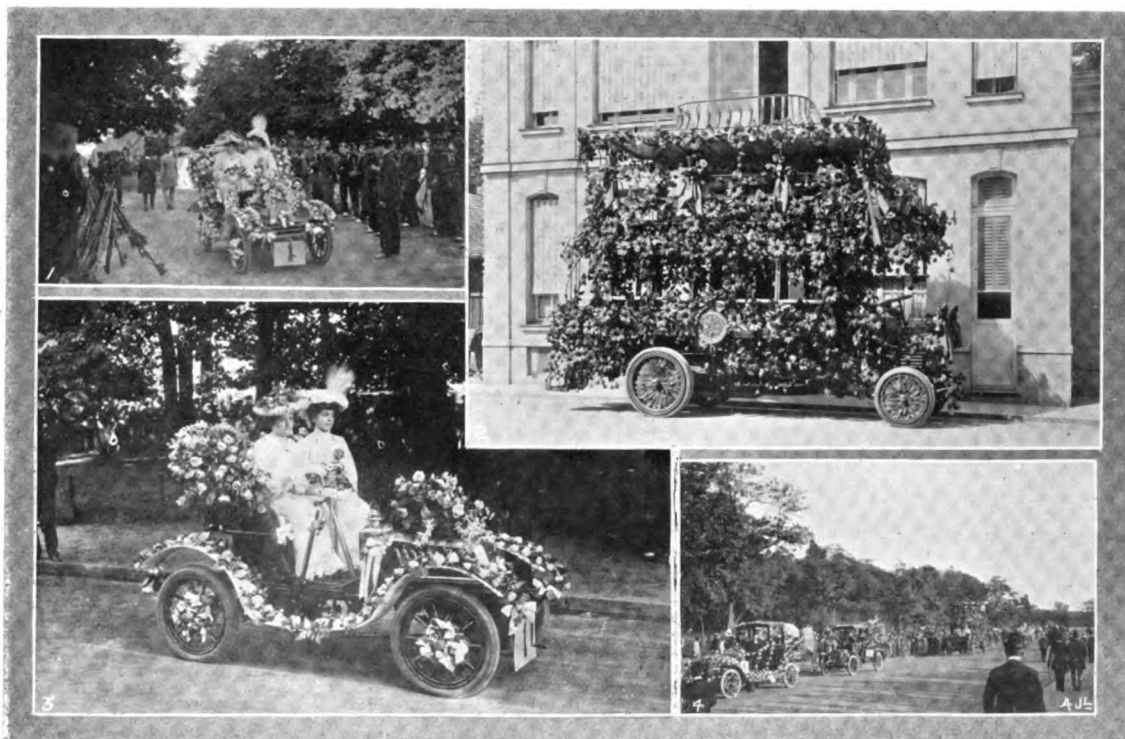


Lady Alwyne Compton has recently become the possessor of a 22-28-h.p. Crossley Landaulette, the lines of which form a particularly pleasing specimen of the coachbuilder's art. Lady Alwyne, who is at present on the Continent, is seen just getting into her carriage, of which she makes very extensive use for town work, in addition to taking a number of long country runs.

"All motorists are strictly prohibited from using any of the roads in Windsor Great Park, except the Sheet Street Road between Queen Anne's Gate and Forest Gate," is the official notice which has been issued by Prince Christian, as Ranger of Windsor Great Park. The Sheet Street Road runs from Windsor to Ascot through the Park.

IN aid of a well-deserving charity, the Moseley Hall (Birmingham) Convalescent Hospital for Children, a very attractive bicycle and motor gymkhana is arranged for to-day (Saturday). The programme will include a number of instructive and at the same time amusing events. The opening items will be for bicycles, and will include a flag race, musical chairs for ladies, and the same for gentlemen, costume race for ladies, donkey-driving race (in which a donkey will have to be led up the course), and an obstacle race. The motor events will comprise a lady passengers' race, starting and stopping, a coach-house contest, and bending and balancing race, all of which are handicaps. The entertainment will start at three o'clock, and will take place in the grounds of the Hospital, Alcester Road, Moseley.

THE annual sports promoted by the Wolseley staff were held for the third consecutive year on Saturday last at the New Inn Grounds, Yardley. The weather, which had threatened to be wet early in the day, fortunately cleared up before the afternoon, and there was a good attendance at the ground, where some excellent racing was seen, despite the fact that the "going" was rather heavy owing to the wet. It was not surprising, in view of the fact that the firm's employees number over a thousand hands, to find good entries in the closed events, no fewer than 72 competitors turning out for the 100 yards handicap, which was run off for the "Siddeley" Challenge Cup.



Upon the occasion of the visit of King Alfonso to Paris, we referred to the striking manner in which the De Dion motor omnibus was decorated for the floral parade, it being one of the leading features of the whole parade. In the above photographs, we reproduce a picture not only of this charming confection, but of other De Dion cars which also took part in this memorable parade.

COMMERCIAL POINTS.

As an example of the great popularity of magneto-ignition, the Simms Manufacturing Company write, pointing out that no less than 20 out of 24 of the competitors in the French Eliminating Trials employed Simms-Bosch magneto ignition, among them being the first seven to complete the Circuit.

We learn from the Anglo-American Oil Company, Limited, that fully 75 per cent. of the motor spirit sold in tins in the United Kingdom is their speciality—"Pratt's Brand." The magnitude of this industry may be gathered from the fact that nearly one million tins are used by the company in its distribution.

MESSRS. MURF, of the Phoenix Motor and Cycle Works, Invercargill, New Zealand, have been appointed sole agents for Simms motors, Simms-Welbeck cars, and Simms-Bosch ignition for the South Island, New Zealand, and all inquiries in this part of the world should be addressed to this firm.

IN regard to a statement which has been made to the effect that one firm supplied all the lubricating oils used for all the racing cars during the recent Eliminating Trials in the Isle of Man, we learn from Price's Patent Candle Company, Limited, that their Oleogine lubricating oil was used exclusively by Mr. John Hargreaves on his racing Napier, Mr. Hargreaves further informing the firm that it proved completely satisfactory, and that he never uses any other in connection with his motors.

NEW COMPANIES REGISTERED.

Deal, Walmer, and District Motor Omnibus Company (Limited).—Capital, £500 in £1 shares.

The Lanarkshire Motor Omnibus Company (Limited), National Bank Buildings, Main Street, Wishaw.—Capital, £8,000 in £1 shares. Object, to purchase the steam motor bus and all other property belonging to the Lanarkshire Motor Omnibus Company.

London and Paris Automobile Agency (Limited).—Capital, £2,000 in £1 shares.

Middleton Pneumatic Hub Syndicate (Limited), 21 and 23, Cale Street, Chelsea, S.W.—Capital, £6,000 in £100 shares. First directors, A. N. Argenti, G. Schilizzi, and J. Davis.

Nonex Safety Tank Syndicate (Limited).—Capital, £5,000 in £1 shares.

North Wales Motors (Limited), Tottenham Buildings, High Street, Rhyl, Flint.—Capital, £2,000 in £1 shares. First directors, H. W. Roberts and E. B. Baron.

Pilgrim's Way Motor Company (Limited), 74, Coleman Street, E.C.—Capital, £10,000 in £100 shares. F. L. Martineau, managing director.

The Scottish Motor Traction Company (Limited), 49, Queen Street, Edinburgh.—Capital, £50,000 in £1 shares. First directors, the Master of Polwarth (chairman), Messrs. R. Craig Brown, James A. Hood, Frank B. Lea, Alexander J. Paterson, and F. M'Dougal Williams.

The Scottish Motor Trade Association (Limited), 23, Rutland Square, Edinburgh.—The liability of each member limited to £1. Object, to encourage, promote, and protect the motor trade.

BRITISH PATENT SPECIFICATIONS. Selected and Abridged by James D. Roots, M.I.Mech.E. Thanet House, Temple Bar, London.

The first date given is the date of application; the second, at the end, the date of the advertisement of the acceptance of the complete specification.

15939 18th July, 1904. Improvements in or relating to Motor Cars. Frederick Strickland, 2, Southfield Gardens, Strawberry Hill, Twickenham. This invention relates to an improved construction and arrangement of gear for obtaining a variation in speed and means for operating and controlling the gear, including the clutch mechanism. There are eight figures. Fig. 1 shows a section of the clutch; Fig. 3 is a plan partly in section; *a* is the gear-box, and *a'* its cover or top. It is formed with extended bosses, *bb* and *bb'*, which form bearings for the shafts. The main shaft, *c*, has two sliding toothed wheels, *d* and *e*, mounted on a square part of the shaft, and a continuation of the square portion is a part of reduced diameter, *c'*, which passes through or within the sleeve, *f*, formed in one with the initial pinion, *g*. The sleeve, *f*, when in position runs upon the shaft extension, *c'*,

ment. The reverse is obtained by gearing *d* with the pinion, *o*. The clutch, as shown in Fig. 1, will be clear from the illustration, the engaging conical part is divided radially into sections for the purpose, as stated in the specification, of obtaining a better grip owing to the slight resiliency produced by cutting out portions in this manner. June 1st, 1905.

26101. 30th November, 1904. Method of Suspension of the Differential Shaft of Automobiles and a Contrivance for connecting the Shaft with the Driving Axle. Auguste E. Brillie, 19, Rue Auber, Paris. Date under International Convention, December 2nd, 1903. This invention is applicable

block, *g*, which on the one side forms a socket at *f*, for enclosing and holding in position the shaft, *c*, and at the other end is held in a collar, *k*. The latter contains an eccentric bush, *i*, made in two pieces which enclose one on each side the two necks, *j*, of the axle, *c*. The arch, *g*, gives passage and support to the casing, *k*, which carries at its centre the differential mechanism. At the two extremities of the casing, *k*, emerge the differential shafts, *m*, *n*, to which are secured respectively the pinions, *p* and *q*, which gear with the internal teeth of the drums, *r* and *s*, of the driving wheels. The eccentric bushes, *i*, are made immovable by a set screw, *t*, holding the bush, *i*. By this means the weight is reduced, and a means of altering the distance between the axis of the differential mechanism and the axis of the wheels is provided, which allows a different toothed wheel of smaller or larger diameter to be fitted. June 1st, 1905.

Patent Specifications Published.

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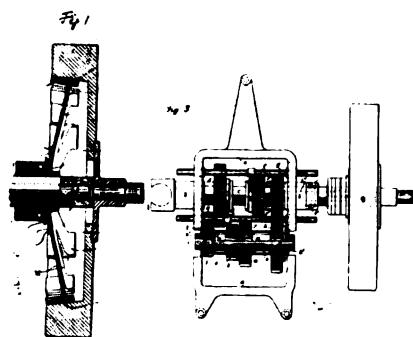
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- 16,084. H. LUCAS. Lamps.
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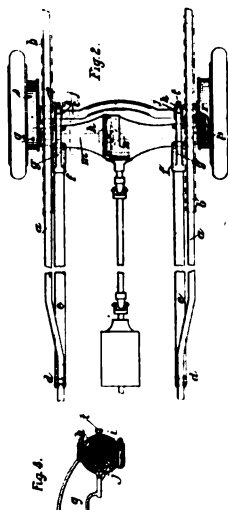
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- 18,155. G. ALDINGTON. Silencer.
- 20,137. E. G. YOUNG. Intl. combn. engines.
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and in the extended boss, *b*. The pinion, *g*, driven from the engine gears with the first toothed wheel, *k*, upon the side shaft, *i*, which toothed wheel, *k*, together with the others, *j*, *k*, and *l*, upon the same shaft are mounted upon a sleeve, *m*, which runs upon the shaft, *i*, which is fixed in bosses, *bb*. On the sleeve, *m*, is mounted a wheel, *h*, always meshing with the wheel, *g*. A second wheel, *j*, engaging the wheel, *c*. The third wheel, *k*, and fourth wheel, *l*, are also carried on the sleeve, *m*. The fourth wheel, *l*, engages with a reversing pinion, *o*, engaged when required with the sliding-wheel, *d*, on the main shaft. Spacing collars, *p*, are provided. The pinion, *g*, engages *c* by means of pins, *r*, fitting recesses, *r'*, so driving the shaft, *c*, and the car-axle direct. The second speed is obtained by sliding the wheel, *c*, out of engagement with the pinion, *g*, and intermesh with the wheel, *j*. The third speed is obtained by putting the wheel, *d*, into gear with the pinion, *g*, removing *c* from engage-



to the known system of transmission which consists in operating the driving wheels by means of pinions gearing with internal toothed wheels fitted to the driving wheels, the differential gear being mounted on sub-frames, of which one end is fixed relatively to the motor shaft and the other is movably mounted upon the frame. There are four figures. Fig. 2 is a plan. Fig. 3 is a vertical section to an increased scale. *a* is the frame of the car to which are attached the springs, *b*, secured to the rear or driving axle, *c*. To brackets, *d*, secured to the beams are jointed the ends of special shafts, *e*. The other ends of these shafts terminate in an arched bearing

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